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Proceedings of the Thirteenth Annual Meeting

OF THE

PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION

JOINT MEETING WITH THE

Pennsylvania Dairy Union

AND THE

Pennsylvania State Board of Agriculture

Harrisburg, Pa., January 24-27, 1911

PROCEEDINGS OF THE

THIRTEENTH ANNUAL MEETING

OF THE

PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION

In Joint Meeting with the

PENNSYLVANIA DAIRY UNION

AND THE

PENNSYLVANIA STATE BOARD OF AGRICULTURE

HARRISBURG, PA.

January 24-27, 1911

Officers—1911—of the

PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION

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INTRODUCTION

The joint meetings of the associations representing the various branches of Pennsylvania's agriculture and animal industry made things hum at Harrisburg January 24th to 27th, 1911. The State Board of Agriculture, the Pennsylvania Live Stock Breeders' Association, the Pennsylvania Dairy Union and the Pennsylvania Horticultural Association all met at the same time and brought out a crowd that was handled with some difficulty on account of its size.

The Corn Show was not the largest that has been held by the Live Stock Breeders' Association, but the corn averaged much better than ever before. There were few inferior specimens. About 150 entries were shown.. The Pennsylvania Experiment Station also made several exhibits of corn with records of production attached.

The eastern corn growers scored this year over the western, getting away with both championship cups. The department of feeding stuffs was on hand with its exhibit, and also the Pennsylvania Live Stock Sanitary Board, which showed among other things specimens of carcasses with various diseases. The Stallion Board presented an exhibit of charts showing the location of pure-bred stallions, and also a display of photographs of great horses. The Pennsylvania Railroad had on exhibition its latest improved live stock car. Considerable of the prize-winning corn went direct to the National Corn Show at Columbus for competition there. Unfortunately some of the best had to be left behind because no classification was provided for it at Columbus.

The Stock Show.

About four carloads of live stock, with a number of express consignments in addition, made up a show that for quality it would be hard to excel. Practically all types of horses, cattle, sheep and swine were represented by specimens of exceptional merit. The live stock demonstrations were extremely popular and those who gave them were kept on their feet a long time answering questions. The exhibition was not confined to breeding animals but included a prime steer and a common one, shown by Pennsylvania State College. These specimens were killed immediately after the demonstration on foot and their carcasses used in a meat demonstration later in the week. The same was true of the fat hog. The prime steer dressed about 64 and the barrow almost 85 per cent. The following breeders furnished live stock free of charge for the demonstrations: Vance C. McCormick, Harrisburg, Percherons; A. R. Van Tassel, Dubois, Morgan horses; M. T. Phillips, Pomeroy, Guernseys; John Y. Boyd, Harrisburg, Holsteins; White Horse Farm, Paoli, Jerseys, Shropshires and Berkshires; Willoughby Farms, Gettysburg, Berkshires; J. B. Henderson, Burgettstown, Dorsets; James Blair, Hartstown, Hampshires; J. F. Lantz, Glenmore, Shropshires; W. A. McCoy & Sons, Mercer, Southdowns; John P. Crozer, Upland, mule-foot hogs; Pennyslvania State College, Angus, Shorthorns, Chester White hogs and Delaine sheep.

CORN AWARDS.

Prof. F. D. Gardner, State College, Pa., Judge.

Yellow Dent—1st, Pusey Cloud, Kennett Square; 2d, George W. Eisiminger, Waynesburg; 3rd, Ephraim Kerr, Ickesburg; 4th, George G. Strosnider, Waynesburg; 5th, Jesse L. Eisiminger, Waynesburg; 6th, J. A. Smyser, Dillsburg; 7th, Norman Miller, Marion; 8th, Harry B. Herr, Lancaster; 9th, M. T. Phililps, Pomeroy; 10th, Burton Bayard, Waynesburg.

White Capped Yellow Dent—1st, Harry B. Herr, Lancaster; 2d, Milton Mendenhall, Mendenhall; 3d, D. J .Herr, Refton; 4th and 5th, George W. and Charles A. Row, Yardley; 6th, A. T. Holman, Millerstown; 7th and 9th, William Fisher, Clarks Mills; 8th, A. C. Cohick, Linden; 10th, B. B. Brubaker, New Holland.

White Dent—1st, J. H. Stein, Greencastle; 2d, E. G. Cloud, Kennett Square; 3rd, C. P. Orndoff, Waynesburg; 4th and 6th, S. E. Musselman, Allen; 5th, Samuel Faust, Obelisk; 7th, G. A. Trimmer, Mechanicsburg;

8th, John W. Trimmer, Mechanicsburg; 9th, Benjamin Sharpless, West Chester; 10th, H. F. Smith & Son, Wycombe Station.

Ninety-Day Type—1st, Pusey Cloud, Kennett Square; 2d, Jos. T. Fleming, Belleville; 3rd and 9th, W. F. Vallerchamp, New Berlin; 4th and 8th, Post Bros., West Alexander; 5th, Paul Trimmer, Lisburn; 6th and 7th, G. A. Trimmer, Mechanicsburg; 10th, Lee L. Trimmer, Mechanicsburg.

Southeastern Type—1st, Clarence Mellinger, Ronk; 2d, C. W. Mohler, Myerstown; 3rd, Milton Mendelhall, Mendenhall; 5th, D. C. Windle, West Chester; 5th, John Clarke, West Chester; 6th, George S. Kauffroth, Gap; 7th, Wilmer A. Twining, Wycombe; 8th, Harry B. Herr, Lancaster; 9th, Joseph G. Williams, West Chester; 10th, S. E. Musselman, Allen.

Flint—1st, F. A. Snyder, Pittston; 2d, Peter R. Boltz, Lebanon; 3rd, George W. and Charles A. Row, Yardley; 4th, John Smith; 5th, Mary A. Boltz, Lebanon; 6th, H. J. Gulden, Bendersville; 7th and 8th, James W. Moore, Bethlehem; 9th, Perham Bros., Pleasant Mount; 10th, M. M. Kendall, McConnellsburg.

Grange Exhibit—1st, Corn Growers' Association of Chester and Delaware counties, Pomona No. 3; 2d, Bunker Hill Grange 1368, Lebanon No. 3.

Grand Champion Exhibit—Pusey Cloud, Kennett Square, Yellow Dent.

Grand Champion Ear—Clarence Mellinger, Ronk, Yellow Dent, shown in Southeastern class.

CORN YIELD CONTEST

In this contest yield counted 70 points, corn at the annual show 5 points, economy of production 20 points and the report 5 points. The score was:

The following were prize winners in the Corn Contest: 1st, Samuel Faust, Obelisk; 2nd, C. W. Mohler, Myerstown; 3rd, G. Martin Cloud, Kennett Square; 4th, John M. H. Wisefi New Bloomfield; 5th, Lewis P. Satterthwaite & Bro., Fallsington; 6th, G. A. Trimmer, Mechanicsburg; 7th, Peter Cruise, Rushland.

Relative Rank on Basis of 100 for Best or for Perfect

	No.	Yield per acre, lbs.	Yield 70%	Corn 5%	Economy of Production 20%.	Report 5%	Av. Relative Rank per ct.
1st—Samuel Faust	20	10,030	100.0	90	95	90	98.0
2nd—C. W. Mohler	31	7,825	78.0	..	90	70	76.1
3rd—G. Martin Cloud....	14	6,570	65.5	100	95	100	74.8
4th—John M. H. Wise....	134	7,050	70.3	91	60	70	69.3
5th—L. P. Satterthwaite & Bro.	133	5,325	53.1	93	80	70	61.3
6th—G. A. Trimmer.....	133	4,230	42.2	88	90	70	55.4
7th—Peter Cruise	35	4,088	40.8	..	95	60	50.6

PENNSYLVANIA WINS AT COLUMBUS.

Pennsylvania won the Zone Sweepstakes for Yellow Dent class in Eastern Zone, with 10 ears exhibited by Pusey Cloud, of Kennett Square, Pa. She also won Sweepstakes in same zone for best ear of dent corn, any color, with ear exhibited by Clarence Mellinger, of Ronk, Pa. By special request, a class other than white or yellow was made for the Eastern Zone and in which White Cap Yellow Dent was exhibited. Pennsylvania won Sweepstakes for Eastern Zone in this class, with 10 ears exhibited by Harry B. Herr, Lancaster, Pa. We lost to Maine on flint corn, both 10-ear and single ear exhibits, and lost to Maryland on best 10 ears White Dent by a very narrow margin.

JOINT MEETING OF THE
Pennsylvania Live Stock Breeders' Association
and
Pennsylvania Dairy Union

Proceedings of the Live Stock Breeders' Association.

Thursday Afternoon, 1:30 P. M.

W. C. Norton in the Chair.

The Chairman: The meeting will please come to order.

Before we enter upon the program for the afternoon the Chair will announce the appointment of the following committees on behalf of the Live Stock Breeders' Association:

Committee on Resolutions—
J. H. Reichert, Scranton, Pa.
Prof. H. E. Van Norman, State College, Pa.
T. D. Harmon, Pittsburgh, Pa.
H. W. Comfort, Fallsington, Pa.

Committee on Nominations—
M. N. Clark, Claridge, Pa.
J. E. Dodge, Narberth, Pa.
W. A. McCoy, Mercer, Pa.

Auditing Committee—
Hon. M. P. Shoemaker, Greensburg, Pa.
James Blair, Hartstown, Pa.

The Chairman: The first subject on the program for this afternoon is an address on "Co-operative Breeding Associations," by Mr. W. F. Raven, of East Lansing, Mich.

I now have the pleasure of introducing to you Mr. Raven.

Mr. Raven: Mr. Chairman, Ladies and Gentlemen, and Members of the Pennsylvania Live Stock Breeders' Association: The remarks I wish to make this afternoon in regard to co-operative breeding associations, I wish you all to understand that it is not the breeder of pure-bred stock that I am talking about today. We endeavor to call the sinners, not the righteous, to repentance. It is the every-day farmer and the breeder that uses scrubs and grade sires in his flocks and herds. Those are the men that I am going to speak to you about.

Mr. Raven then presented his paper as follows:

MICHIGAN METHODS OF LIVE STOCK IMPROVEMENT BY A SYSTEM OF UP-GRADING

By W. F. Raven, East Lansing, Mich.

Michigan occupies a unique position in the galaxy of states in regard to its live stock industry. Some interesting features are presented in a brief review of the history of the development of the live stock industry in Michigan. It has not been as rapid as in some of the states to the westward which went into the live stock business a few decades later, and which have now far outstripped us in the number of cattle. But the natural conditions, as the pioneer found them in Michigan, were not suited to the rapid development of the live stock business. He had to produce the proper conditions. The first settlers found nearly all the surface of Michigan covered with heavy timber. As in all forest regions, the forage of Michigan was scant in quantity and lacking in nutrition for live stock.

The land had to be cleared before forage and fodder crops could be produced. As in all timbered sections the settler had no desire to own more cattle than were required to supply the immediate needs of his family; he was loath to feed live stock the cereals which were produced on lands requiring so much labor in the clearing and cultivation. During the early histories of the state the energies of the farmer were diverted to other lines of work than live stock production. In general, we find the history of any new country, that far more attention is given to crop production. This has been particularly true of the Eastern and Central States, while the reverse has been true of the far West. The rich virgin soil responds freely at first, yielding prolific crops of a variety of cereals possessed of high commercial value. Finally, however, the land become less and less productive; the farmer begins to turn his attention to live stock production. Michigan reached its zenith in the production of wheat, which was the cash crop (in 1884-1885) in the southern four tiers of counties, and the yields of that cereal began to lessen the State over. A small minority of the settlers had brought with them good cattle, and from the first had kept and bred improved live stock. With wheat, the money crop, lessening in yield, the opening of the newer western lands decreased crop values. On the other hand, smuts, rusts, blights, and insect pests of various kinds began to appear, materially affecting both the quantity and quality of the crops produced. These conditions demanded the keeping of more live stock on the farms in order to enrich them and utilize to better advantage those crops low in value in the raw state, they had to be manufactured into meat, milk and wool and thus many were led into some line of animal production. I believe, at this period (1884-1885), a majority of the farmers of Michigan began growing more live stock. There were a few places in the State where a dairying had been carried on from the earliest settlement (notably in Lenawee County). The southern portion of the State had in many instances good flocks of the merino and grade merino sheep and small herds of good cattle. In the first attempts to improve the cattle nearly all were of the beef type. This continued until the low price of beef compelled other than beef sires to be used. The farmers then turned their attention to dairying and began to improve their cattle by the use of pure-bred sires on the grade beef cows (particularly grade Shorthorns). This system continued until the Spanish-American War, when beef rose in price until there was a good profit in growing it. Many that had been using dairy sires changed to beef sires and bred the progeny of the dairy sire to the beef sire. The indiscriminate admixture of the blood of the various breeds has been one of the most direct causes of the production of inferior stock. This has not been restricted to the breeds within the beef and dairy classes, but includes admixtures of the blood of the two classes. Another potent force tending toward the production of inferior cattle in Michigan is found in the too prevalent use of the grade and scrub sire and the saving of calves from bulls bred to females for no other purpose than to freshen them again. The lack of good breeding among our cattle today is not due to the lack of the introduction of god blood at an early date. Shorthorns were brought into Michigan in 1843, Galloways in 1854, Herefords in 1864, Aberdeen Angus in 1884, Holsteins and Jerseys were also introduced at comparatively early dates. The records of Michigan Fair Associations from the time of the organization of the State Fair in 1849 would seem to indicate that an unusual activity in pedigreed live stock breeding was manifested in the earlier days, but this seems to have been confined to the so-called breeders.

The initial step in live stock breeding for improvement confronting us today is an exceedingly simple one; we do not need to undertake the establishment of new breeds, as there are plenty now in existence to choose from, which judiciously chosen will respond favorably to the conditions to which they are adapted. The first step in line of live stock improvement must come from the cessation of the practice of admixing of the blood of various breeds and of using grade and scrub sires.

It would seem highly desirable that some form of co-operation in breeding methods should be established by communities, such, for instance, as the joint ownership and use of males by several parties rather than one. One cannot conceive of any logical reason why several men in a community could not form a co-partnership in the ownership and use of good sires. If such a plan could be followed the good influence of superior sires would become more far-reaching and fewer males in all would be needed than in the case of individual ownership.

Dean Shaw of Michigan Agricultural College, believing that some form of co-operation in the ownership and use of pedigreed sires could be made satisfactory to the members of such an association, submitted a recommendation to the State Board of Agriculture in December, 1907, urging the necessity for immediate action on the part of the college toward the development of co-operative organizations among the breeders and farmers of the State, designed to stimulate live stock improvement. This recommendation was accepted, adopted and the Agriculture Department authorized to undertake the work. In the organization of breeders' associations in Michigan five chief aims are sought.

1. The improvement of the farmer himself, not only as a raiser of stock, but as a tiller of the soil, a business man, a citizen and a man.
2. The improvement of the flocks and herds of the State in their productivity and uniformity. Productive ability in being increased by the continued use of prepetent pure bred sires. By adopting a single breed for an entire locality, buyers are attracted and a local market created.
3. The principle and spirit of co-operation is fostered by co-operating in the purchase and use of breeding stock, the farmer learns to act in unison with his fellows and is able upon occasion to extend the same principle into other fields.
4. The farmer is trained in business organization and conduct. Rural communities are conservative, even to a fault, and agriculture is seriously crippled by the lack of business methods and business system.
5. The improvement of the grade of live stock kept renders possible the further increase of capital upon a given area, and is one more factor in increasing the possible profits from the farm. Thus far in Michigan, with two exceptions, the work has been confined to cattle and the first steps were taken among the dairymen, and it was possible to reach this class easiest through the creamery condensary and cheese factory organizations and patron lists. The attention of the stockman and farmer was directed to the plan through the co-operation of the State press and the Field Agent has been working in those districts only, in which his services were requested by the people. Before taking up the work in person in a given field copies of the following introductory letter were sent to the patrons of the creamery, condensary, cheese factory or stockman and farmers of the locality, viz:

"Dear Sir—The Agriculture Department of the Michigan Agricultural College has been authorized by the State Board of Agriculture to undertake special work in this State, endeavoring to stimulate the improvement of horses, cattle, sheep and swine. The proposed plan embodies a vigorous offer to induce farmers and stockmen to procure and use pedigreed sires rather than grades and scrubs. This plan is not only to advocate the individual ownership of good sires, as far as possible, but also to promote the establishment of associations for the joint ownership of males. It will be the duty of the Field Agent in charge to present a practical method of live stock improvement to individuals and gatherings of farmers and breeders. As far as possible he will furnish information relative to the description, characteristics and adaptability of the various breeds. He will also lend assistance personally in the organization of associations for the joint ownership of sires and the promotion of improved breeding. Through the agency of the State Live Stock Breeders' Associations, lists of breeders with pure bred bulls for sale can also be furnished. If you are personally interested in live stock improvement and are willing to assist in interesting the people of your community, the services of the Field Agent can be secured without cost to you or the people you may succeed in interesting. Details of work will be given on request.

Yours very truly,
FIELD AGENT IN CHARGE."

When requests are received, the Field Agent calls upon the individual stock owner, looks over his animals, presents the co-operative plan of breeding to each man personally and secures data relative to the following direct questions, viz: (1) How many cows do you own? (2) What breed or combination of breeds are they? (3) What were they bred to last year? (4) If you were to conclude to breed them to pure-bred sires continuously, which breed would you prefer? Where the owners of eighty or more cows have signified a preference for some breed the Field Agent then endeavors to induce the owners of forty or more cows to adopt the same breed, thus securing sufficient for an association of three groups. The individuals are then invited to meet at some suitable place to discuss the proposition from every viewpoint.

When the owners of one hundred and twenty common cows decide upon some particular breed from which to select males for improvement, then an association may be formed. This particular form of organization containing one hundred and twenty cows is divided into three groups of forty cows each, with one bull for each group. There may be from two, or three to seven or eight men in each group, depending upon the size of the herds, or there may be more groups in the association depending upon the willingness of the people of the community.

Each member joining an association is required to sign the following agreement, viz:

"We, the undersigned, desiring to organize a bull association do hereby promise to pay equal sums of money on or before ...., for which we agree to take equal shares of stock in the aforesaid association when organized. This association is organized for the purchase of three or more registered .... bulls, provided three groups of forty cows each can be secured. The understanding is that these bulls are to be owned in common and changed from group to group every two years, thus providing service for six years. In case of the three group association at the end of two years to avoid in-and-in breeding, the bulls are changed from one group to another and the same thing is done at the end of four years. In this way, barring accident, or loss of bulls by death, the association is provided with registered males for a period of six years at an initial cost of from $10.00 to $40.00 per member. The owner within each forty cow group should be somewhat closely located, but this is not true of the groups, which may be several or more miles apart, their only concern being an occasional business meeting and the exchange of sires every two years.

This plan has been put in operation in over thirty places in Michigan and is working successfully for the improvement of Michigan live stock. Under this plan there was this year between six and seven thousand common and grade cows bred to pure bred sires. This plan has many things to recommend it to the farmer who wishes to improve his live stock; (1) the low initial cost; (2) the advantage of always having a pure-bred sire available for service; (3) the use of mature sires; (4) associations will buy better sires than the average individual; (5) when whole communities are interested in one line of breeding it makes a market for their surplus cattle, because they are grown in sufficient quantities to attract buyers.

In conclusion, gentlemen, the work done in Michigan has not been done in the thickly populated places in the southern part of the State. Most of the work has been in the sparsely settled sections, among the stump lands just as the lumbermen left them, as the settler is making his home. Some of you perhaps know that in Michigan we have several hundred thousand acres of good hardwood land, and the settlers from Pennsylvania, Ohio, Illinois and Indiana are coming to these places and making homes there, and it is among these people that that work or most of it is being done.

I thank you. (Applause.)

The Chairman: Now, Mr. Raven is here and ready and willing to answer any questions that you may ask in regard to this matter. We want you to fire the questions into him. This is the most interesting part of the question. It is your opportunity to bring out the things you wish to know.

Mr. Harmon: How would you go about it in a thickly setled community where there is an old-established breed and that prejudice to be overcome?

Mr. Raven: That is one of the worst troubles we have to overcome—breed prejudice. I have now on my list twelve or fourteen associations where they are already to organize could they agree on the breed of cattle, and it is necessary for us to hold meetings—sometimes I have held four to five meetings to try to overcome breed prejudice and educate them to a solution corresponding to surrounding conditions. Greater advancement has been made in our country where they have no breed prejudice. But we are overcoming that. For instance, we have an old Van Buren County organization in the breeders' association; we also have a Holstein association that takes in Lenawee county; we have an island in the Detroit River, Grosse Ile, that every man on the island except one breeds Guernseys. We try to educate to overcome this breed prejudice. I want to go at them this way: "Gentlemen, don't you think it would be right and proper and a money maker to breed Jersey cattle at this point? If this man can make money the whole of you can make money. Howell is one place in America where more Holstein breeders get their mail than any other place. Twenty-five or six receive mail at Howell. It is said that more breeders of Holstein cattle receive mail at Howell than any other postoffice in the United States.

A Member: Who selects the sires?

Mr. Raven: All of these associations are incorporated for a period of thirty years. It is not a one-day affair or a one-year affair, and the men that go into these associations intend to breed one kind of cattle continuously, so each association is governed by a board of five directors who do all the business. In some of these associations the college has to assist them in the selection of sires, and in most places we get some young men that know nothing about cattle and somebody has got to be educated along breeding lines and these are the men we attempt to educate. We say, go out and buy the sires, get the best information you can and use your own judgment. We try not to interfere with the business proceedings in any way, shape or manner. They have the right to buy whatever sires they want; they can pay whatever price they want. Sometimes it is a good thing to have them buy poor sires first and then they know where they lost out and are more careful. Each association selects its sires, buying where they like. We furnish them with a list of all the breeders of the State breeding that kind of cattle.

A Member: What kind of cattle do they breed the most of?

Mr. Raven: The three dairy breeds today stand almost even. Some months one breed is ahead and sometimes the other. Out of the thirty-two associations organized there are but two of the beef type. The Holsteins, Guernseys and Jerseys stand about even. I think at the present time the Holsteins stand ahead, but otherwise they are about even.

A Member: What do they pay for the bulls?

Mr. Raven: Various prices; all the way from $75.00 to $200.00.

A Member: Have you noticed any tendency to buy better bulls since the organization?

Mr. Raven: Yes; associations buy better bulls. While my work is along association lines, I have placed more bulls outside of associations than inside of the associations, because a great many men refuse to join associations and will breed all the same. At one place I organized a Guernsey association and placed five bulls in the association. There were seven bulls bought by individuals outside, so I had two more to my credit outside the association than inside.

Mr. Harmon: What about the productiveness? What have you noticed in regard to the increase in products, the marketable products, since the organization of these breeding associations?

Mr. Raven: We have hardly got to that point yet.

Mr. Weld: Do you make any attempt in your associations to get the numbers and keep records of the productions of the females?

Mr. Raven: Yes, in all cases.

Mr. Weld: Is that part of the association work?

Mr. Raven: That is part of the business; and right following this I want to say to you that the cow-testing association follows the breeders' association. Right along comes the cow-testing associations.

A Member: Who keeps these bulls?

Mr. Raven: I expected that question. In every association group there is one man centrally located as to his particular group that keeps the bull for hire. There is a service fee for each member; that goes to paying for the keep of this sire. For instance, it costs $40 to keep the bull a year; each of the forty members in group pays one dollar service fee towards the keep of the sire and he pays that to the caretaker of the sire when the service is had. The caretaker furnishes the secretary with the name and the date and the number of the cow bred. That is part of the record.

The Chairman: Gentlemen, have you any more questions? We want to keep Mr. Raven busy. We don't like a dead one. We want you to be alive and up-to-date. We want to move along. Ask him any questions you see fit and don't be bashful. This is a subject that ought to interest all of us engaged in the live stock industry.

Mr. Weld: Do you succeed in getting the members of the association to take hold of the work of record keeping or weighing and testing of the individual cows in their several herds or is that done by the association?

Mr. Raven: That is done by the cow-testing associations.

Mr. Weld: Altogether?

Mr. Raven: Yes. We have two associations; one the cow-testing association and the other the community breeding association. In all cases it takes more cows to form a cow-testing association than a community breeding association, and in all cases where there is a cow-testing association in a district in which a breeders' association is located the larger part of the members of the breeders' association will become members of the cow-testing association. They keep their records more easily. It takes twenty-six herds of cows, no matter what number, to organize a cow-testing association, so that the tester can visit each herd once a month. In some associations, especially the Freeman in Wago County, our breeders' association and the cow-testing association are one and the same thing; every member of one is a member of the other; but in other places it is not so.

A Member: How do you avoid spreading disease by breeding to the same sire?

Mr. Raven: By a rule in the by-laws that any member that has a female affected by contagious disease is barred from the use of the sire until thoroughly free from the disease, and he must file a certificate with the caretaker.

A Member: Do you have to be a member of this association to have the good of service in that bull?

Mr. Raven: No, sir; you do not; but if you are not you have to pay two or three times the fee for service above the others.

A Member: Wouldn't that be a good way to get these outside people interested in these breeding associations?

Mr. Raven: Yes, it would. The difficulty we find in Michigan—it may not be in Pennsylvania—but in Wisconsin, Minnesota and Michigan and North Ohio—that is, whenever a man is progressive in introducing a pure-bred sire his neighbors will not use it; if they do use it they refuse to pay a service fee equivalent to cost and he gets tired of the business. Just as sure as fate the next pure-bred sire brought into that neighborhood is one of a different breed. If I introduce a Shorthorn my neighbors will introduce a Holstein or some other breed. In these associations wherever they do not have cows sufficient for the bull they will allow outside persons to buy his services, although they have to pay two or three times the cost to the members of the association; but it is a good way to get the improvement of stock. And I find this, in our oldest association at Blissville that was organized four years ago in March, I find in that community that nearly all of the people, with two or three exceptions, are breeding Guernsey catle. I think in a few years Blissville, Mich., will be as noted for Guernseys as Howell, Mich., is for Holsteins, simply because they show the facts to me. They have been breeding upon the common stock and the farmers have got down to buying pure-bred Guernsey sires and in many instances pure-bred females of the Guernsey breed.

We do more than that. We keep a record in the Department of Agriculture at college of every member's herd, of the officers of the association, and some member from the Department of Agriculture visits each of these associations once a year at their annual meeting; sometimes the president of the colloge; sometimes the secretary of the colelge; but more often those directly engaged in the work, the head of the Dairy Department or Dean of the Agricultural College, some member of the faculty visits these associations and hears the plans and methods they are using for improvement of live stock, and we keep a record of these things. (Applause.)

The Chairman: I notice we have with us Mr. John D. Nichols, of Cleveland, Ohio, president of the National Dairy Association, and we would be very glad to have him come forward and give us a little talk.

Ladies and gentlemen, I have the pleasure of introducing to you Mr. Nichols, president of the National Dairy Association.

Mr. Nichols: Mr. Chairman, Ladies and Gentlemen: I fail to understand why your chairman should have butted in on the discussion that was going on, as I assure you much more good could be gotten out of the discussion than you can get out of anything I may say to you.

I have been very much interested in the address and discussion following, and I can only voice the sentiments of the gentleman, that a breeding association is very valuable to all parties concerned. It is valuable to the members of the association; it is valuable to the community living around where the association exists; and it is valuable to the fellow who is looking around for a particular kind of stock that association is breeding. If you don't believe that, you start out and try to buy three, four or five carloads of cows of one particular form and have to drive from pillar to post, from Dan to Bersheba to find the stock you want. You have to go through sections of the country which it has been my fortune to visit and you find two or three Jersey herds and two or three Guernsey herds and two or three Holstein herds and you will find two or three Ayershire herds; and you have to drive all around to buy a carload of one particular breed.

Another thing. There has been much said about the sire. I believe that the greatest mistake made by the breeders of dairy cattle in this country today is in the selection of the sire that heads the herd. It has been said that the sire is half the herd. Sometimes I think it is about nine-eighths, especially if you are going to raise them. I have a friend back home who was talking to me some years ago—one of the largest dairymen in northwestern Ohio. He said: "I want to show you a couple heifers I got"; and he took me to the stable and showed me two females four years of age, sired by a good sire at a cost of $4.50 fee for each animal, and the rest of the herd were bred to a sire at acost of 50 cents, and the result was that he would not have to talk long to get $125 apiece for those bred by the good sire and those bred at a cost of 50 cents each he would have to talk an ear off to get $6 for. Now, that shows that that original investment was pretty well made.

The cow-testing association has done wonders and I believe it is going to continue until it will revolutionize to a large degree the dairy business. I am a member of a cow-testing association, while my herd is so far away from the home of the association that I have no benefit in a general way. They have demonstrated with a cow-testing association of twenty-six members that one of the members can produce milk with his herd at a cost of sixty-seven cents per hundred pounds and has now got these figures—I should not quote them because I think he has got about $2.42 from his herd for each dollar's worth of feed consumed; and the poorest dairy in the herd has paid the owner about eighty-six or seven cents for each dollar's worth of food consumed. One of these fellows has realized that he has a good herd and the other fellow has realized that the herd has got him. And those things happen wherever there is a cow-testing association.

I had the pleasure last winter of visiting a large part of the dairy section of Vermont and in every particular county there every little while, as I was looking for Jersey cows, having some Jerseys, every little while someone would say to me: "Have you seen Deacon Harvey's herd?" "No, I have not got there yet." "Well, he has got the best herd in this country." And in a little while some other fellow would say: "Have you seen Deacon Harvey's herd?" And I would say, "No, I have not yet." "Well, he has the best cows ever in this country." After awhile I learned I was a couple of miles from Deacon Harvey's. So I went up to Deacon Harvey's and out from the house came a nice, genteel-looking old Vermont Yankee—you see, he didn't look like us Pennsylvania Dutch. And I said: "Mr. Harvey, I heard much of your herd of cattle and if you don't charge too much I would like to see them." He said: "If you don't get too close it won't cost you anything." I went over to the barn and he had a large herd, in the neighborhood of 50 head, of the most beautiful, uniform type of dairy cattle it was my pleasure to see in the State of Vermont. And I looked them over very carefully and I said: "Uncle Harvey, what would you pay for cows like these?" He said: "It would not be right to price them. I would not care to price them. It would not be right." I said, "It is a good time to sell when you have a buyer. What would you ask me to pick out a few and let me depend upon my own judgment? I may get the poorest ones as well as some of the good ones." He said: "Well, I need a little money, and if you mind to pay $60 a head you may pick out a few." So I picked out three and I went up to open the stanchionto let the fourth out and he said: "Hold on, Mister, I won't sell another one." Well, I argued with the old gentleman, but could not get any more. When I drew him my check for those three cows he saw my name on the check and he said: "Are you the president of the National Dairy Association?" I said: "Yes, sir; I have that honor." He said: "Well, you must know Governor Heard." I said: "I certainly do. I am glad to say that Governor Heard is on my list of most intimate friends." "Well," he says, "when you see the other gentleman give him my regards. When you first came here you told me that that was the best of dairy cows you had seen in Vermont and he is to blame for it. You told me that this stable was one of the good old stables and he is to blame for it. Twenty-eight years ago Governor Hoard stayed over night with me here and he took a pencil and he drew out a plan of a dairy barn and this was the plan. And he told me to always use a pure-bred sire and I have always done it." Now, what was the result? There was not an animal in that man's stable but what any buyer of cows would have been glad to have bought at his price, not your own; and still you find today hundreds of dairy farmers throughout this land of ours using inferior sires upon their herds, and it is the greatest mistake the breeder of dairy cattle or any other kind of stock a man can make.

Going back to Governor Hoard just a moment: I trust that everyone here is a reader of "Hoard's Dairyman." I doubt if there is an article or an issue of "Hoard's Dairyman" but what if the dairy people of this country would read and properly they would find some section in that publication that would contain all-sufficient knowledge to pay them to their entire year's subscription; and I am not selling "Hoard's Dairyman," and have no stock in the publishing company. That comes from the heart. At the last meeting of the National Dairy Show when I first met Governor Hoard there I shook hands with the old gentleman and I said: "Governor Hoard, how well you look and how glad I am to see you." That old gentleman put his hand on my shoulder and says: "My son, these remarks are very kind in you, but they are very untrue because I am going to that Great Beyond from whence no traveler returns." And I want to say, Mr. Chairman, that when Governor Hoard passes to the Great Beyond the dairy industry of this country loses the best friend it ever had, and I doubt if it will ever get one as good. (Applause.)

In the course of my talk with the Governor, I said: "Governor, did you ever meet an old gentleman by the name of Harvey?" "Yes," he says; "Deacon Harvey, way over in Westminster Valley, Vermont. Some twenty-six or twenty-seven years ago I spent a night with that good old Yankee friend of mine." Now, folks, if it had been your Chairman or I that had met Deacon Harvey we would have said: "I don't remember." He remembered twenty-eight years ago.

Now, Mr. Chairman, I got to leave you at three o'clock, and I think I better go down and pay my hotel bill; but I want to say to you and your association that I have enjoyed my visit here very much, and I am very much pleased at your meeting, at your attendance here. There is only one thing wrong with all dairy meetings. The fellow that you want isn't here. The fellow that you want is home, back down in his narrow confines, and he says: "Them fellows down to Harrisburg think themselves pretty smart." That is the trouble. (Applause.) And he is the fellow that ultimately will be driven out of all business. There is no business on earth that will stand the losses and the slip-shod methods that the dairy interest of this country is standing today, and there is not a branch of industry that is making more money than dairying along twentieth century lines with a good herd of cattle and watching the business.

Now, I hope, Mr. Chairman, to meet you and your officers and every member of your association at the next meeting of the National Dairy Show. I don't know whether Mr. Van Norman has sneaked out of the room or not. It is kind of funny to me that a Pennsylvania grass widow or young woman of some sort has not got Van. Now, Van is not a bad fellow. I think he has gone out of the hall. I wish he had not. I never like to say anything behind a man's back. I don't dare to.

I want to talk about the fellows we want and are not here. How can we get them here? I don't like to tell stories in a meeting of this kind, but a fellow once said to me, how are we going to change the methods of these old men, these dyed-in-the-wool and burnt-red fellows; how are you going to get to them to do it? I said, there is only one way, and that is like the Irishman who was about to die and sent for a priest to come and pray for him, and after the priest had prayed with him for awhile he said: "Now, Pat, is there anything further you want? If you have any sins you need forgiven, you better be thinking about it, because you have but a few minutes to remain." "Well," says Pat, "there is something I'd like to speak about, but not unless you know that I am going to die pretty quick." The priest said: "You have only a few moments and if you have any sins to be forgiven you better speak about them now." "Well," said Pat, "I wanted to convert a Jew." "Well," the priest said, "it is no sin to convert a man and if you converted a Jew it it an honor and a credit instead of a disgrace and a sin." Pat said, "Wait a minute, Father. I used to run a ferry boat, and one day I was rowing a Jew across and he fell into the water and I raised him up and I said, 'Do you believe in the Holy Catholic Church,' and he said, 'No, sir'; and I shoved him down again; and in a minute or two I raised him up and I said, 'Do you believe in the Holy Catholic Church?' and he says 'No,' and I shoved him down again; and I raised him again and I said 'Do you believe in the Holy Catholic Church?' and he says, 'Yes, sir,' but I could not believe him and I shoved him down." You ask how are you going to get the fellow here you want? The Lord knows; I don't. But I like to see a meeting of the dairy farmers of this State and to have them talk about legislation. I believe it is part of the duty of the State to have inspection of milk and if that inspection could be made by inspectors who had knowledge of the business sufficient to entitle them to that title of inspector, the cloesr the inspection could be done the better and that would force the little fellow out. I wish I had the time to spend; I would tire you out. I have seen all sides of the milk problem. The producers of milk as a rule do not realize how important their work is. If they did they would make their dairies better. They don't realize that 65 per cent. of the babies born in this land are raised upon the milk from the dairy cows, the foster mothers of the nation. And now, Mr. Chairman, it is a terrible thing to say, but it is true and I hope there is none in the hearing of my voice, but I know there are thousands of dairymen that are milking from diseased cows and putting it into the cans and shipping it to the city to be consumed by those sick and dying children. I know that is true in Ohio and I know Ohio is not so much worse than Pennsylvania. I wish that the time would come when we would have all such people driven out of business and then the fellow who makes good milk will get compensated, and not until then. (Applause.)

The Chairman: The next item on the program is the Meat Demonstration by H. W. Norton, of Howell, Mich.

Ladies and gentlemen, I have the pleasure of introducing to you Mr. H. W. Norton, of Howell, Mich., who will give a demonstration in cutting up the carcasses of these prize steers.

MEAT DEMONSTRATION

By H. W. Norton, Howell, Mich.

Ladies and Gentlemen: The question of quality of meats is one that has not been considered and understood to any great extent until recently. A few years ago there was not much attention paid to that subject and meat was taken in the carcass and sold strictly on the weight basis without any consideration particularly to the fineness of the quality as indicated by the different points which we consider, and it is not until very recent years that any particular attention has been paid to this subject. The addition of the dressed carcass competition class at the International Live Stock Exposition in Chicago has done more to excite interest in the question of quality in meats than anything else; and at the present time every year we have in the Chicago stock show a dressed carcass competition in which the stock is judged on foot and slaughtered and judged on the clean carcass. The judging on foot does not always agree with the judging of the clean carcass, which shows that the science of judging beef cattle is not an exact science. At the present time it is not quite so thoroughly understood as it will be after a few years when more attention has been paid to it and we have more slaughtering tests and more work done. These two cattle that were used by Prof. Cochel yesterday afternoon over at the Market in the live stock demonstration will be shown here this afternoon in the cuts, showing you the difference in the two carcasses after they are cut up over the block. In preparing these two carcasses I have had the side of each one cut into the wholesale cuts and these will serve to show you the difference in the development of the cuts, the difference in the size and thickness of the flesh, the grain, the fat, color and different points taken into consideration in judging the carcass. It might be well at this point to take a few moments to consider the judging of carcasses. In the first place, for a carcass to be prime, to be selected as a prime carcass or credited as a prime carcass, it is necessary to have a high dressing per cent. The reason for that is that the dressing per cent. depends largely on the condition of the animal, the meat, the fat the animal carries. The fatter the animal, generally speaking, the higher the dressing per cent. This is the most important point in controlling the dressing per cent. Aside from the amount of fat that the animal carries we have also the breed. Steers of the beef breeds will dress a higher per cent. than steers of the dairy breeds. This is true because the beef breeds have been bred for a great many years for the thick, heavy carcass. The dairy cow has been bred for capacity to milk, for refinement in form, for the incurving thighs, the curved ribs and low hind quarter, etc. If you are looking for dairy cows and find one that is fat and meaty you discard her, saying she puts her feed on the back instead of in the belly; and along that line steers from the dairy breeds will not dress as high a per cent. because not so thick and meaty. There is more waste in the internal organs. The digestive capacity has been developed to increase the milking capacity in the dairy cow and the steers take the same course in their development, and so the steers of the dairy breeds will not dress as high a per cent. Another fact which has to do with the dressing per cent. is individuality. There is a difference in steers of the same breed which we can only account for by individuality. In the slaughter tests in the Michigan Agricultural College along the line of determining the dressing per cent. of cattle of different market grades and to illustrate the difference which you find in cattle of different grades, we took steers of the five market grades as you will find them quoted in the different live stock dailies and the daily papers, prime, choice, good, medium and common steers. There were slaughter records kept and they showed that prime steers dressed on an average of 63 per cent.; the choice steers, 61.9 per cent, about 62 per cent.; the good steer 60.7 per cent.; the medium steer about 58 per cent., and the common steer 56 per cent. These figures, of course, would vary a little. These figures are not necessarily the figures that would be shown for averages of cattle of these grades, but they grade down very nicely from the best market grades to the poorest. The breeds will also show some variation. Figures taken from the slaughter tests that have been conducted by the different experiment stations throughout this country show that the beef breeds, for example, the Shorthorns, Herefords and Angus, in the average of all slaughter tests taken showed a dressing per cent. of 63 per cent., 64 per cent. and 65 per cent.; while the dairy breeds as compared dressed 60 per cent. to 62 per cent., a difference of some 3 to 5 per cent., and with a much wider variation, but these are average percentages. There is also a difference in the dressing per cent. of heifers and cows as compared to steers. Steers will dress a higher per cent. than cows or heifers. That fact is one of the reasons for the difference in the prices paid for steers over heifers in practically the same condition in the market. The buyers always prefer the steers when they can get them and largely because they will dress a better per cent. When we come to judge the carcass the high dressing per cent. is important because it indicates that the steer it fat; it indicates a finished condition, or a fat, finished condition.

To take up the points of judging carcases, or meat in detail as they would be followed through, if you were watching a judge in a carcass contest, the first would be the sides that were hung in the coolers and the judge would examine them, having his figures to show the dressing per cent; having looked them over he would examine the sides for the general conformation or shape. The shape that is desirable is a very compact, very think fleshed, solid, blocky form; just the same practically as you like in the live animal in judging fat steers or cattle. In comparing the sides we like to find the hind quarters or the round very full, thick and short. Now, if I had a rack so that these quarters could have been hung up before you it would be possible to show something about the difference in conformation, the difference in shape of these sides, but not having any place to hang them up it is impossible to do that, but perhaps I can show you on the cuts when we come to the cuts. The round should be very full, the thigh full and fleshy. If you compare heifers with steers, in the round the steed always shows fleshier and more compact round, while the heifer's is inclined to be thin and incurving. The round should be fleshy down onto the hock. The meat should run down to the hock so that the shank is very short, so that there is very little shank not covered with meat. The loin should be full and smooth, showing no depression on either side of the back-bone, but rather filled out full and round, showing that the carcass should have on bunches of flesh, plenty of loin meat and make a nice thick loin cut when you come to cut up for steaks. The ribs should show some conformation, well sprung from the back, not a sloping side or flat and not sprung out too full, so that we have flesh over the ribs. We want them well arched out from the back so that you find a good "eye," a good large amount of loin when you come to rip them down. This is what the butcher calls the "eye" of the beef. When you come to rip the side, rip them down, cut off the fore-quarter from the hind quarter, you expose this muscle. That is called the "eye." And as the carcass hangs from the side we like to find the flesh and thick on the hip and not sloping off, so that they will show a thick, full muscle. Of course, the thickness there is sometimes deceiving, and while the carcass may look good in the side when you come to cut they may not be as thick as you expected and the knife is the only safe index to follow. You may be easily deceived by external appearance.

The shape of the front quarter is important. The butcher likes to have the chuck well developed, thick, not heavy and showing too much weight in the front quarter, but should be thick and compact. The neck should be short, as little neck as possible, and on prime steers there should be practically no neck. This is an inferior cut and the butcher does not care about much of that. The less neck the better.

The next point after considering the form or shape of the carcass would be to consider the covering of fat. Now, for finished beef to have the prime quality it is necessary to have a very good covering of fat all over the body and completely covering it. The covering as shown on this best steer, when you come to look at these cuts I will show you there is quite a difference in the extent of the covering, the completeness of the covering of fat. A good layer of fat all over the body, as complete a covering as possible, is desirable in order for meat to hang in the coolers and ripen, in fact, it is necessary. A high-class trade desires meat that is left to hang in the coolers to ripen, and for meat to be properly ripened in the coolers this complete covering of fat is necessary. Poor cattue, where that covering is lacking, will not hang in the coolers and stay in good shape. They become soft and silmy and you cannot hang them any length of time before they spoil; but cattle well covered could hang in the cooler for any reasonable length of time and still be all right, and the ripening would increase and improve the quality, instead of making it poor, as it would with poor cattle. The covering of fat should be complete, extending over and covering all parts. Coming down on the round as the sides hang up the round should be well covered. It should be covered last; or, if covered up on the round the rest will be covered. The color of the fat is an important point. The color should be white, the whiter the better, and white rather than yellow. The white fat is considered as an indication of young beef, while if the fat is very yellow it indicates age. This is not necessarily always true. Cattle from some of the dairy breeds, as Jerseys and Guernseys, will kill yellow even at two years, especially the Guernsey's coating. They show a very rich orange-colored skin, and that color seems to sift through the fat, and two-year-old Guernsey steers will dress yellow and will sell as cow beef. The color is not necessarily controlled by the breed. Lots of cattle of the beef breeds will sometimes dress yellow. It is due a great deal to individuality. You cannot tell until the steer comes out of the cooler whether he is going to dress nice and white or not. The fat covering should be complete but not too great. Generally there is no trouble with cattle too fat. The kind of stuff that comes on the market in the smaller cities is usually unfinished rather than overdone; while in the big markets we come across cattle too fat, great soft or large bunches of tallow over the ribs, round, tail, head and rump, and that would be objectionable. But generally speaking, in order to get high-class beef and sufficient finish to make it we must have some waste fat or tallow. There must be some trimming, and when we come to cut us these big steers there will be some considerable trimming on some parts; but in order to get the best grades of beef some trimming is necessary.

The coloring of the lean also, when you come to rip them they should show a bright rich red color rather than a dark color. A very dark color is undesirable. Poor cattle without much fat and old cattle generally dress dark, but good prime beef should show a nice bright red color, not perhaps too red to be fiery, but a nice rich red color.

Those are the points you take into consideration principally in studying quality in beef: the dressing per cent; the general shape of the body; compact, well filled, thick round, thick loin, and well shaped on the ribs; good thick, compact chuck, but not over-developed in the front quarter; and short light shanks. The smaller the bones, as indicated by the shank, the better from the butcher's standpoint. There will be less bone trimming and when you buy a piece of meat you get more meat and less bone in the cut, or a greater proportion of meat to the bone.

The graining of the meat and fat, that should be very firm and fine grained, not too coarse, not soft; it should be very firm. We have to make some allowance for these cattle because they were only killed yesterday at 1 o'clock, and have not had sufficient time in the coolers to harden down. They ought to be left in the coolers for at least twenty-four hours more; a little more than that would have been better. They have been cooled out very well considering the length of time they had. The big steer is pretty well cooled down for a heavy carcass of this sort, which was only in the coolers for twenty-four hours. The fat should be very firm and the hardening of the fat is what gives firmness to the carcass. You take a side of beef from a poor steer where there is no fat and it is impossible to harden it except by freezing. Cooling them down does not give them that firm, solid condition that we look for in good beef. The muscles slip back and forth and are soft and slimy and you cannot harden them. The mixture of the fat through the elan also is important. For proper finish we like to find the fat well mixed through the lean, a good mixture of fat; but this does not mean fat in there in bunches, the way it would be more apt to be in the dairy breeds if put in here, but marbled through, as the butchers' term it, or mixed through in small particles, splashes of fat mixed in through or flaked in; and a proper marbling mixture of the fat through the lean is necessary for finished beef.

Now, I will try to get more of these cuts in shape so that you have a chance to look at them and see just how they show up. Now, in comparing these two rib cuts from the two steers, these two cuts made in the same place show you quite a fine comparison of the two. The larger rib cut there is from the big steer, the white-faced steer, as they stood before you in the ring yesterday, and comparing these two you can see a marked difference in the amount of fat covering around the surface of the lean meat there. This one here has avery small covering and the lean through the eye—this round muscle is the eye—is not nearly so thick on the rib and has not so much fat mixed through the lean, and the eye here, while a well-developed eye and good piece of lean meat, is not so nicely marbled and finished, not showing the mixture of fat through the lean that the other one shows. Now, this cut here is finished very nicely. There is a nice mixture of fat through the elan, marbling through the lean, and we have a good layer of fat over the surface. That is just a little bit more fat on there than desirable in most markets. For high-class trade such a cut in large cities like New York and Chicago, this one here would be exactly what they look for and the butcher and retailer could handle this to a very good advantage. For the ordinary retailer though, one which has not quite so much fat, more like this one here, would meet the demands of a great many. The most of the retail dealers in the small towns where there is not a high-class special trade would not like that. Of course, this one here is without doubt the best cut, has the best flesh, the best quality of the two, but the retailer could not afford to handle this one in a great many cases because he could not get the price for it as he would have to trim off and he would not be catering to a high-class trade enough to afford to trim off this one. A mixture of fat through the lean shows that it is finished. In finishing cattle the priming up is to improve the quality of the meat, not to increase the size of the animal or weigh so much as the quality. The weight is produced in growing and quality improved by finishing. The feeder generally grows the animal and another man very often buys them up as feeders and finishes them, and the work he carries out is to improve the quality. A mixture of fat through the lean improves the quality of the meat by making it tender and more juicy and incerases what the chemist calls soluble extracts which gives it better flavor, and tenderness and juicyness and flavor are all important in finishing, and these are the points which govern quality in judging cuts. That is the prime object in improving quality. In comparing these two you have a nicer color in the top one, the fat is very white, the lean is a nice red color and there is a very complete covering and nice mixture of fat through the lean; while this one has yellower fat, a thin covering, is not so nicely colored, a little bit dark or dark spots through that and the quality would not be as good. Now, in comparing these two cuts, the two loin cuts, as they are taken out, you will notice that on these two there is quite a difference showing in the size and in the shape. The cut here from the larger steer is very much thicker, fleshier and heavier, more meat in proportion to bone, very much more meat in proportion to bone, the fat is mixed through better, more fat mixed through the lean in the case of the larger one than the smaller one and there are a few bunches of fat in this cut. What we like is to have the fat mixed through the muscles, not laid between the muscles in large quantities; this is not desirable. You will notice the fat covering the surface in these cuts. We have just a nice covering here, around here; up here there is no covering at all, and if you compare these two cuts you see on the surface that the loin from the big steer is completely covered, has got a smooth even covering; while the one from the smaller steer shows dark flesh there, showing where the lean shows through the covering and practically not covered; just a little membrane, not much fat covering. You see on comparing these two chucks the difference in shape. The chuck from the big steer is fleshier and thicker chuck. When you come to cut them up, if cut up into steaks, the thickness has a great deal to do with the amount of steaks, and you get more steaks and better quality out of this kind of a chuck than you would from thin cattle, and comparing these two you see quite a difference in the thickness. This one here is round, full and thick, and this other one is flat sided and does not show the development, and the marbling you notice in the meat of the big steer it is nicely marbled, and through the fat and lean it shows the finished condition.

Well, now, I will cut up these other two quarters and cut them up in what would be the method of cutting on the Chicago retail market. The cuts that I will make will probably be different from some that you may be familiar with in this part of the country, but that will probably be brought out later on with the questions. The first cut that we make in cutting up the front quarter is to take off the shank. The shank would be cut off just a little bit below the elbow bone and running on the top line of the quarter and would be used principally for soup meat or the lean could be cut up and made into hamburger or mixed into the sausages, but is principally used for soup meat. The wholesale cuts of the shank make up about 4 per cent of the carcass, genearlly about 4 per cent in the Chicago wholesale cuts. It is difficult to handle a quarter of this size without having it on the hooks, cutting on the hooks it would be much easier to get at it, and it could be done much more rapidly. Now, the next cut after removing the shank is to take off the plate, the lower part of the ribs. We would start at this point, cutting into the pit of the shoulder, then cut between the ribs there and off across the cut made in taking off the ribs, including this back part here which is called the navel, the front part which is called the brisket and the plate altogether. This one cut makes up about 14 per cent., generally 14 per cent; of course, it will vary somewhat in the way it is cut. The plate is one of the hardest pieces to cut up right, and it is used for moking short ribs of beef. It is also used largely for making corned beef, cured and salted for corned beed. In cutting the front quarter into meat for the Jewish trade, for what they call "Kosher" trade, they would cut the first five ribs right off from the front end of the chuck, inculding the first five ribs, cutting through here down to here; that would leave these ribs here; follow along that down to here. The next cut on the front quarter is removing the prime rib including the same cut I showed you on the other side of this cut here. This is a fresh cut. It shows a little better than the one I showed you before. It shows marbling and mixture of fat and lean in this case very nicely. All the lean is mixed through well with fat, showing a nicely marbled cut. There is a little too much fat there in one or two places. That is cutting as it would be on the Chicago market, when you cut one rib on the hind quarter, and would include seven ribs coming back on the last rib as it is here. It is the eighth rib. This is the prime rib, the best rib, where you get the best rib roasts. That is where you take out the rolling and standing roasts, cutting off the rib or couple ribs there, that would be rolled up and would make a very nice rolled roast. That leaves the chuck, which is sold as a wholesale cut. The chucks as cut in this way would run 25 per cent of the carcass. The rib there, I did not think to mention that, would be about eight-tenths per cent. Generally the chuck is 26 per cent, the shank 4 and the plate 13 or 14 per cent. The chuck would be used for cutting up in cattle of this sort, back there, these ribs, and the front part used for roasts, cutting off a couple of roasts across the arm here, and a couple of these arm roasts and leaving the shoulder, it would be used for shoulder roasts and the neck used for boiling meat. You will notice I was speaking in good cattle we like to find the neck short and small, not showing any neck. If you notice the neck on that chuck you see practically no neck. The steer's head was fastened on the shoulders, the neck very short. You take a steer of poor quality, poor breed, it would show more neck than on this. The neck is only three or four inches long and it has not been trimmed. It is right next the head.

On the hind quarter we start cutting up the hind quarter into these four wholesale cuts. First you take off the flank, starting inside the round or thigh and taking off this flank or muscle. The flank will make up four to seven per cent., depending largely upon the condition of the steer. A very fat steer will cut more flank than a thin one becaues the flank is one of the places where the fat is deposited heavily. The cod fat and the fat on the flank is very thick in fat steers. The flank will run from 4 to 7 per cent on the general figure; on ordinary cattle, 4 per cent. The flank steak is cut from the inside. This muscle here is pulled right out and that is the flank steak. The rest of it is generally used by the packers to make corned beef and chopped up to make different kinds of sausage and boiling meat.

We next take out the kidney fat, or suet. This is the best grade of fat on the body. It varies largely, depending on the condition of the animal. We figure 4 per cent. It will run higher than that in very fat cattle. But cattle of poor grades when highly finished, the dairy steers or steers of inferior quality, when very fat will cut more kidney fat than well-bred steers. The dairy steers and steers of poor quality when they are fat, will put more of their fat on in places where it will be trimmed off, more in bunches, and they get very heavy kidney fat generally.

The last cut on the hind quarter to make the wholesale cuts is to take the loin from the round, and in making that cut you cut in front of the aitch bone here, removing the loin and separating the loin from the round. The loin makes up about 17 per cent of the carcass; the round about 23 per cent. The loin is the best part of the carcass, from which you get the best meat. The front end gives the porterhouse or pin-bone steak and the sirloin is cut from the back part of the loin. Cutting up the round further, the first cut would be to remove the top part here, cutting off the rump, and cutting that off you cut just below the point of the pelvis, or this aitch bone, as commonly called by the butcher; cut just below that and then remove the rump from the round. This, as it stands now, before cutting any more, is what the packers term a wholesale round. It makes up 23 per cent of the whole carcass. This top of the wholesale round is the rump, used by packers largely for corning, making corned beef, and makes a very good roast as the retailers handle it. It is largely pinned and put out as rump and makes a good roast. The rest of the round, as considered in the retail market, this portion here, is made up into round steak, cutting about one-half inch thick or three-quarters of an inch thick, or made by cutting thicker, made up into round roasts. The packers make a lot of that into smoked beef hams and dry beef. If handling one of these to make up into dried beef you will notice natural divisions between these muscles here. We cut down on this here to the muscles. You can separate and tear them right apart, getting several long strips. They are used at the lower end to cure and smoke for making dried beef. But if cutting up into retail cuts, into steaks and roasts, the lower part here would be sold for the butt roasts or boiling pieces. It is tougher, more tendons or cords. It is cut off from the bone, making a crescent shape or horseshoe shape, and used for butt roasts or boiling meat; and the rest of the shank is used for soup bone.

The Secretary: Which is the tenderest piece in the round steak?

Mr. Norton: The tender part of the round steak is the inside part here. The inside muscle of the round steak is the tenderest part.

The Secretary: The muscle part or hide?

Mr. Norton: The part on the inside of the thighs, the two thighs come here. The inside or middle part would be the tenderest part.

And the loin, in cutting up the loin you often hear the question asked about the tenderloin. The tenderloin is this muscle that lies right on the inside of the body there, between the suet or kidney fat that I have taken out, and the back bone; on the inside of the body, the tenderest muscle in the body, and for that reason is demanded and high price paid for it by a good deal of the trade. It is not so juicy and so well flavored as some of the other parts or cuts, but more tender, and that is a very important point. The best tenderloins that are put upon the market, if we start them up here, this line, it would spoil the porterhouse and spoil the tenderloin or true porterhouse. For that reason the most of the tenderloins put on the market come from what they call stripper layers, the loins of a poor class of cattle, where stripped out and disposed of to the best advantage, the cheapest part being put into canned beef. Stripper cattle furnish most of the tenderloins that go to supply the trade, as well as from the poorest grades of cattle. They also take some from the better grades that are so bruised in shipping so that the loin cannot be sold over the block. In that case the tenderloin could not be injured, being on the inside of the body, and the tenderloin would be stripped out and sold as tenderloin of the beef, and the rest of the beef, especially some of the part which would not be hurt, put on the market as muscles from cattle injured or bruised in shipping.

A Member: When we buy dried beef we buy it by two different names, the knuckle and the plate? Where does this part come from?

Mr. Norton: I don't know that I can answer that question. I am not familiar at all with the terms used in Pennsylvania.

The Member: The knuckle and plate of the dried beef?

A Member: You were dividing it up a bit ago. That is what it is.

Mr. Norton: In separating these out you separate the different muscles in the natural division and the best part is the inside and it may be the terms you speak of are applied to these different parts.

The Member: When you divide these muscles, how many pieces do you make?

Mr. Norton: One here and one there. The outside is not as tender as the inside. We split it and make two.

The Member: Do you ever cut dried beef out of the front quarters?

Mr. Norton: No, I don't know of any cut that is used. This flank steak is the best part of the loin.

Mr. Bayard: Do you people want to see this hog cut up?

The Secretary: It will take a little time, but time is nothing to the hog.

Mr. Bayard: Some of us have more time than others. One thing I don't want you to forget is that we are going to sell the corn that we have on exhibition.

A Member: Where?

Mr. Bayard: Right here. If you want to look at it just go up and look it over and come down here and bid on it. We will sell it by prizes or anyway you want to bid.

A Member: A gentleman in the rear wants to know where you will sell the apples?

Mr. Bayard: Right here after we are done with this. We cannot carry them down.

A Member: The gentleman back here wants to know whether they will be there after they are sold?

Mr. Bayard: They will. I will sell the prize-winning apples; but I want to say to you that you cannot take your corn away because it is to go to the National Corn Show, where it will win some more glory for you.

Mr. Norton: This side of pork is from one of the animals used in the judging ring yesterday. I will cut this up, showing the different cuts as we would cut it if going to cure the shoulders as pickled hams and going to cure the hams, showing the different cuts made in trimming up these shoulders and hams, making the loin to be sold out as loin from the retail shop.

First take off the shoulder, cutting as I have cut this one, back of the fourth rib. This is not necessary. If you want to make a heavy shoulder you cut farther back and for a lighter shoulder you cut only three ribs. Up at State College we have been just starting some experimental work in curing hams and shoulders and cutting them up the same, cutting them between the fourth and fifth ribs, and cutting that way you notice this shoulder would be trimmed out and the first trimming would be to take out the spare ribs, cutting close to the bone. That gives you what they call butcher's spare ribs. It is very thin spare ribs, of course, used for packing up and roasting. It is quite a choice cut but not cut heavy like what we call farmers' spare ribs. The next cut will be to cut off the shoulder butt, right across the top, about one-third the top, what the packer would call the shoulder butt. The top across the top of the shoulder blade. This would be called a shoulder butt. Trimming off the fat we would have the fat separated like this. It is called the clear plate. This plate or piece of lean taken out would be called the clear plate and that is used by the packers and cut up into chunks, put down in salted brine and shipped to foreign countries and also somewhat used in this country for certain classes of trade in the mining and lumbering districts, and it is known on the provision market as clear plate. Ordinarily the farmer would simply trim that off, of course, taking off the rest of the lean and use it for making lard. This lean portion that is left from the shoulder fat is practically all lean meat and makes a very nice roast, or if sliced across this way, crosswise, about one-half inch wide, about the thickness of pork chops, it makes a very nice steak and is called "Boston Butt" by the packers.

Now, in cutting off the ham from the middle, the point where you make that cut is dependent upon whether you want to make a heavy ham, and if you want to make an American ham we cut half way between the aitch bone and the rise in the back-bone. You notice at this point on the back-bone there is a rise; the back-bone curves up there in the pelvis, and here is the aitch bone. It is split when I opened the hog up to take out the intestines; cutting half way between, so as to make an American or short ham. If we want to cut a heavy ham, cut further up in the loin. This end will give you your ham right if trimmed up and shaped. The packers would trim that up, starting with the tail bone and striking around here and taking out the tail bone and also cutting on this side back, taking off this flank here and smooth that up, taking care not to take off too much flank because the flank will shrink in curing and if trimmed too close the flank will draw down to the flesh and will not show up as well as if trimmed long. In curing they shrink considerable. The trimmings, of course, would be used for sausage meat.

Mr. Bayard: Did anybody ask what this hog would weigh?

Mr. Norton: 450 pounds.

Mr. Bayard: Dressed?

Mr. Norton: 390 pounds, dressing about 86 per cent.

Mr. Bayard: What did the best steer weigh?

Mr. Norton: He weighed before he left home 1,500 pounds. He dressed here about 64 per cent. The little steer dressed—you fellows guess on that.

Members: 60 per cent, 58 per cent, 54 per cent, 56 per cent.

Mr. Norton: That steer will surprise everybody by dressing 60 per cent. We cannot account for it in any way except that he was a Prohibitionist and did not take a drink this morning.

Mr. Norton: Trimming off this loin, you notice how thick the fat; this furrow over the back there; this shows good form. Cut right along the back, splitting the back bone, you have a layer of fat four inches all the way along. It is a nice fine layer and very firm and hard considering the length of time it has been in the cooler. It shows good quality; and the cut made to take off the lean, you start on the ridge a couple of inches from the center of the back bone and bring the cut out at the lower end so as to leave all of the tenderloin in the loin, so as not to cut into the tenderloin, to run out at the edge of the tenderloin, the round muscle on the inside, the same as on the beef. This loin, trimming off the fat would be what the packers call a wholesale loin, after the back fat is taken off. This wholesale loin, where you get the pork chops, cutting the rib chops from the rib end, the upper end, and the loin chops from the lower end where the tenderloin muscle is lying on the inside here. The rest of it there that I trimmed off, this clear fat part, is called the fat back. It will be chunked up into pieces five or six inches square for packing up in barrels and tierces and brine and salt as fat back, clear backs. A certain class of trade will consume clear fat meat of this sort and it is used for that trade, and also a large part is used for making lard. The best quality of lard comes from the leaf. This had a very heavy leaf and that was the prime lard on the carcass, and the nextgrade of this is fat back I take off the loin. The packers in making up the best grade of lard—the best grade would be 40 per cent leaf and 60 per cent of this fat back—they don't make any pure leaf lard. Of course, the leaf forms a small proportion of the lard in the carcass and they mix that with the best lard from the back, the best grade of fat backs, to make their No. 1 kettle rendered lard. The rest of this should be cut up just as it stands into pieces five or six inches square and cured, salted and put in brine for mess pork; or the rib could be taken out the same as the spare rib, and the rest of it cut up into chunks. On the farm that heavy fat of this sort and ribs are taken out and the lean separated from the fat and the lard rendered and the lean made up into sausage. For making bacon or anything of that sort it would be out of the question. It is too heavy. According to market requirements fat bacon hogs should weigh from 160 pounds to 200 pounds, and small hogs of that size should be cut into bacon, and heavy hogs of this sort should be cut into mess pork, barrel pork and hard salt pork, as commonly called by the packers, to a large extent.

A Member: Where do you get the sausage meat from?

Mr. Norton: In cutting it up in this way the sausage trimmings would be only the trimmings taken from the shoulder in trimming that bone to make a picnic ham and the same thing in shaping that. You don't get very much sausage trimmings in cutting in this way. On the farm generally when you come to cut up heavy fat sides of this sort this would be torn up and the fat rendered into lard and the ribs taken out and the ribs used for sausage and also the top off from the shoulder, this Boston Butt, that perhaps would be made into sausage meat. That makes good roasts and steaks if sliced across.

(Applause.)

The Chairman: We will now offer for sale the corn and apples that are on exhibition upstairs.

I now have the pleasure of introducing to you Mr. E. S. Bayard, who will conduct the sale.

Mr. Bayard: Ladies and Gentlemen, I am sorry that we have to sell this corn this way. This corn has been engaged to go to the National Corn Show, at Columbus, Ohio. Any corn bought here that we want to go to Columbus we have the privilege of taking. It will be shipped to the buyer from Columbus.

One thing I am sorry to say here is that some people have so disregarded the rights of others that they have spoiled some of the exhibits that Pennsylvania desired to stake its reputation on at the National Corn Show in Columbus. Some people have shelled off some of that corn and spoiled it for the show. I wish I was big enough a man to kick anybody of that kind clean out of the community.

This corn will be sold and shipped to Columbus and shipped back to the buyer from Columbus, if we want to keep it to send to Columbus.

There is not much we want to send there, for the reason that they have only three classes for corn at the National Corn Show. While some of the corn here cannot win money at Columbus because there is no class for it, still we are going to send some out there for purely decorative purposes.

A Member: Who pays the freight?

Mr. Bayard: We pay the freight both ways.

The first prize corn was shown by Pusey Cloud, of Kennett Square, Chester county, one of the richest counties in the United States, and I hope they won't let that corn get away. Unfortunately, owing to a thief in our midst, we have only nine ears of that corn left. Some scoundrel has stolen one ear of it. If apprehended he will be arrested.

A Member: That is what we get for coming to Harirsburg.

Mr. Bayard: I have held corn shows in Pittsburgh, in Philadelphia and in Harrisburg. I have been at all of these Breeders' Association meetings and attended all the corn shows and I think the proportion of thieves is about an even thing all over the State. You Philadelphia people are not any better than the rest of them. But this is the first time we ever lost a whole ear out of a grand champion show.

The Chairman: Gentlemen, we will now adjourn until 7:30 o'clock this evening, when we will have some good lectures. Adjourned.

THURSDAY EVENING, JANUARY 26, 1911—JOHNSTON HALL

Hon. W. C. Norton, president of the State Live Stock Breeders' Association, in the Chair.

The Chairman: The meeting will please come to order.

The first thing on the program this evening will be an address by Prof. Menges on Corn. Now, we have about an hour that we can spare to the Road question and Corn. We will divide that time up as near as possible between the road and corn questions, and then we will come to the alfalfa and following that the milk scoring will also be announced.

Prof. Menges: Mr. Chairman, I am not on that program.

The Chairman: Well, perhaps I had better explain.

Prof. Menges: I think you had better.

The Chairman: Mr. N. H. Brewer, of Hockanum, Connecticut, was on the program for this evening on the subject of "Successful Corn Growing," but he could not come and Prof. Gardner was required to be in Columbus, Ohio, tomorrow morning, so he could not stay, and therefore we have asked Prof. Menges to talk to us a few minutes on the corn question.

Prof. Menges: Mr. Chairman, I am the very man every time. I am sorry that I have to intrude myself upon you tonight, but I will promise you that unless I get very much interested and I see you are that I won't talk very long.

I have been on this corn breeding work for about eight years, and I have found out only a few things in farming, because I cannot devote all my time to it, but I have to make a living breeding corn in Pennsylvania just now. There is not enough money in it, but I believe there is enough money in it for every farmer to go into it and do it for himself; and I think I am talking to farmers who own farms and live on them, and farm them. I don't know how it would be with a fellow that rents a farm to go into anything of the sort. I do not know how it would be for the man who rents his farm to the other fellow, whether he ought to go into it. I do not know how it would be for him; but I am talking about the man that owns the farm and lives on it and works it. I believe it would be a paying business.

Another thing I have learned: I have learned that corn can be developed for any particular section of the State. You cannot go to Ohio and buy your corn, bring it here and for the first two or three years get results such as you ought to have. You cannot do it with any Western corn. I have tried that several times and I say you cannot do it, but I have found that if you get a corn that is adapted to your soil, your climatic conditions and the seasons that you have at your disposal for growing corn, when you have such a corn, that is the corn to work on, and every farmer ought to have experience enough to know when he has got that kind of corn. The first thing you want is quality. I say that is the first thing; you want to get as much corn and as good corn as you possibly can get on your farm. I said a little while ago that you can develop that is adapted to the soil and climate you have. Last summer, that is only this last year, I had an experience that convinced me more of the truth of the statement I am making now than anything that has happened. I had about two bushels of the best seed corn I believe I ever had. The man that I used to work with died last winter, and I had to get somebody else to work with me on this business, and I went to a fellow whom I knew very well. He said, we can do that work on our farm and we have better land than you have over there. That was true. It is this red soil we have in York, Lancaster, Chester and Montgomery Counties. You know what it is, Mr. Sharpless. On that kind of soil we raised the corn, and I say it was good corn. We took that seed corn and planted it on the richest soil in York County and I thought we would get a crop of corn that we could brag about for years, but we didn't for some reason or other that I cannot explain—I am not here to explain—for some reason or other that corn reverted. It went back to its great grandfather, a whole lot of it. Some of it had big cobs, but we didn't have any corn like that, not at all. Some of it was short grains; some of it was not filled out and all that kind of thing; and I cannot blame anything but the different soil condition.

A Member: You planted it in the wrong time of the moon.

Prof. Menges: No, sir, we have gotten away from the moon in York County. Some fellows had it shining around here, but that has not anything to do with our corn. I cannot explain it but that very corn on the red shale had yielded up to ninety bushels to the acre of shelled corn. Now, how did we do it? That is the thing you are interested in, I know. We started out about eight years ago with the improved Leaming corn, but I did not know very much about it then, and I do not know very much about it now. But we started out to select the stock that gave us the very best kind of an ear, and the very best kind of a stalk under normal conditions. We did not take that stalk that stood out there by itself and produced a big ear. You know when you select the large ears out of a lot of corn and don't know what stalk it came from you don't know where that stalk stood, or what kind of environment it had about it. So we want to know the environment. We want to know whether that stalk that produced the large ear did so in an environment where any other stalk had grown and produced an ear, and the stalk that produced the largest ear and the right kind of an ear, and the right stalk, and the right foliage, and the right kind of a tassel and the ear at the right height; that was the stalk on which we selected the seed corn to begin with. But I want to say to you that takes a little bit of work. Now, we have found this, that when we select seed corn from the stalks that have done well under the environment where it had to fight for everything it had gotten that you gain a strength of character behind it that you do not get when you select the seed corn right at random, right out of the pile. We have found that. Now then, after working along that line for a little while we went to corn breeding. We selected the best ears we could find, those that suited us best, and we planted those ears in the rows by themselves. Suppose we had an ear here that was just exactly what we wanted, and we took the corn from that ear and we planted it in row No. 1; and suppose we had another ear that suited us very well. We took the corn from that and we planted it in row No. 2, and the corn from another ear in row No. 3 and so on until we had twenty or thirty rows. We had that corn there pitted against itself just exactly as you dairy men do with your cows. You know what every cow is worth to you and what she produces in money for you. You can do the same thing with corn. And then we watched that corn and gave it good cultivation, the kind corn ought to have. We planted in rows three and a half feet apart, and three feet apart in the row. That is two stalks to the hill. That is thick enough planting. A lot of people plant pretty near twice as much as that; that is, twice as thick. But I want to say you are doing it at the risk of getting quantity when you plant that thick. You get nubbins when corn is planted too thick, and you do not want nubbins. That is the thing we have been fighting. We had these twenty or thirty rows of corn running parallel through the field and we could see what they would do. They were up against each other in competition. And what did we find? We found here a row that would have a lot of nubbins, by selecting the very kind of an ear you see. Then we had another row that had barren stalks in it, then we had another row—and this happened last summer—after seven years' work along this line—

then we had another row with ears away up there, six feet above the ground, entirely too high. I say this very thing happened with the ears of corn last summer in my case, after seven years' work on this line. I cannot explain it. That row of corn did not ripen out of the limits of our season. We have about one hundred and twenty days, fully one hundred and twenty days in which to ripen corn. Still you have another kind of a row. You have another one that had weak tassels, and another one that the ears are produced too low on the stalk; they ripened too early, do not take up the entire season. And so you pick out. You have here an opportunity of seeing just exactly what the results are and that will give you a pretty fair average of what you have in your entire crop, to show just exactly what these ears are capable of doing and what will be the result. Now, select the seed corn from the row that has given you the largest quantity. We ought to do that, but I do not always do it. Not always. Why not? Because some of these rows had produced a lot of nubbins, two years on the stalk and not very large ones, and I do not like that and I am growing corn. Mark this, I am trying to get a stalk of corn that will produce one large ear. Now, what do I mean by a large ear? I mean an ear that will shell about fifteen ounces of corn to the cob. About eighty-six per cent. of corn to the cob, that is the kind of an ear I want. I have not done any work along this line of raising two ears on the stalk, but want an ear of the size I have already indicated. That is the kind that suits me. Now, after you have worked for these results awhile, I have worked on this line, and you have eliminated the rows that produced nubbins and barren stalks and stalks with ears away up here and others away down here, and with weak foliage and all that kind of things, and you have selected those that are doing the very best, and that is the kind I want—let me say right here that the nubbins will disappear. I mean that little fellow about this long.

Mr. W. H. Ream, living on the same kind of soil I am talking about, this last summer in a dry season, had a crop of corn produced in the way I am trying to tell you and the shortest nubbin was that long (indicating). That is a pretty fair ear in some climates, pretty fair. The longest ears were twelve inches long, and that is the kind of ear I want, if I can possibly get it.

Now, the next thing—and, Mr. Chairman, if I talk too much tell me, because I may be getting interested. Now, the next thing I am going to talk about—and if I have not made things plain ask me questions, and if I can I will answer them. The next thing I am going to talk about is the kind of ear. What kind of ear do you want? We had some here today that suited me first class. I want an ear twelve inches long, as near as I can get it, but if I can't get a twelve-inch ear that has grains as long as a ten or eleven-inch ear has, then I will take the ten or eleven-inch ear; I want the grains on the long ear just as long as on the shorter ear. Now why? Because I always get more corn, that is why. Never sacrifice length of grain for length of ear. When you have to get an ear that has a grain only one-fourth inch long, always take the short ear that has a grain five-eighths of an inch long every time, that is my experience. And then what else? Then if I can get it—I know I am not talking scientifically when I say this—if you can get it, have the rows straight and the grains equal size, and the butts filled out and the grains running over the top filled out; I want to get just as much corn as when the rows are crooked, and I take the ear that has straight rows, provided it gives the quantity of corn, but if it don't do that, don't take it. I never do. It is quantity I am after. Take the crooked rowed ear provided it has a good body and more corn than the straight rowed one; while I say this is not scientific doctrine, and that is not corn breeders' doctrine, but that is what I do, and I am telling you what I do. That is what I know about it.

Another thing I want to talk a little bit about is what kind of a a grain you want. You want a grain five-eighths of an inch long, and about one-eighth of an inch thick, sometimes not quite that much, and it ought to be a quarter of an inch and a little more across. And then it should not be pointed like a shoe peg. Never plant shoe peg grains of corn. Now why? Because they are low in vitality. They have not a good germ. That is the trouble, and there is where the trouble is, and you want as strong a germ as you can possibly get, and you do not get it in a shoe peg grain.

Now then, after you have selected this seed corn carefully, you want to take good care of it. The best kind of care of it. Put it some place where it is dry and where the air can get at it and dry it out so that there is not sufficient moisture in it to freeze when the temperature goes to zero and below. And then after you have got on that far and you start in with corn breeding—and let me repeat again, I do not care what part of the State of Pennsylvania you live in you can develop a corn that will be suited to your climate and to your soil, and the best corn to do it with is the corn that you have now. Go out there into that field, select the kind that we have talked about, select those ears we have said you ought to select and the kind of the grain and begin breeding from them and breed up five or six years, or seven years; you will have developed a corn that will be better suited for the climate and soil conditions that you have than any corn you can get anywhere else, I don't care where you get it. I believe it is the bounden duty of the farmers of Pennsylvania to breed up along this line and do that work.

Now, my friends, I have introduced this subject, and thank you for your kind attention.

The Chairman: We have a few moments we can spare yet if there is any one that would like to ask the Professor a question.

Walter E. Seely, Luzerne County: I would like to raise a corn that has a high protein value, and I must go home from here not knowing which of these varieties is best. Would it not be possible to have a little type-written list accompany these various types that we might have the information along with the show? This has been the first corn show that it has been my privilege to visit. I have read somewhere that different varieties of corn differ in their contents. I am not saying this to criticize, because older heads have brought this meeting about than myself, men of more experience, but I am going to say I am very much disappointed in looking over the varieties of corn here that a little more of the history and analyses is not given with some of the varieties. I would like to raise a corn that is particularly rich in protein.

Prof. Menges: Mr. Chairman, might I reply to that question for a minute? It is not very difficult to determine the quality. I would not like to say composition, but the quality of corn, by the use of your pocket knife. Take your pocket knife and cut a grain parallel with the one side, lay it open and there you will see the various components that enter into the composition of a grain of corn. You have the outside hull, then you have the gluten, then you have the starch coming next to the germ, on both sides of the germ, and then you have what you call the cornstarch and the germ. When you have a grain in which that hard, horny gluten move in and nearly touches the germ and sometimes entirely touches it, you can conclude that you have a corn that is high in protein, because 85 per cent. of protein in a grain of corn is contained in that horny gluten and in the germ. Now, that is the only thing to do; don't let it be understood that my talk would lead anybody to think that it is absoluely conclusive, but it is well nigh absolutely conclusive that you have a high protein corn, when you have these conditions.

Mr. C. T. Mitchell: In regard to Prof. Menges' speech about the renter and the owners of the farm, about selecting this seed corn, it is for the benefit and a paying proposition for the renter to be very careful in his seed selection. It will pay him more to look after his seed and the selection of his seed in order to produce a better crop. Now then, in buying a seed that is not adapted to the soil. Get corn adapted to this climate, adapted to your soil. Go through your fields, select your seed corn as Prof. Menges has mentioned, get the right height of your ear, the right stalk and you can produce your ear then after you do all the selecting. In talking about the shape and characteristics of the ear: There are ears that the rows are not perfectly straight, but the ear carries its form out to the end, and carries its seed well, and Prof. Menges says that it may not be the perfect ear, but it has the vitality to it. Now then, after you get all these points in order to raise such kind of a cornstalk, you must have something back of it. You must have good soil, you must have enriched your soil. We feed quite a large bunch of stock on our farm and we try to eliminate this burning and wasting of manure which will burn white in twenty-four hours if piled up, and it is no earthly good to the soil. Is that right, Professor?

Prof. Menges: Well, I would not make it that strong. The organic matter that is contained even after the nitrogen has been burned out is of some value.

Mr. C. T. Mitchell: That is true. Now, we went and got what they called South Tennessee brown rock, sometimes known as floats. When our stables are cleaned the manure piles are leveled off and there is about six hundred pounds of this rock spread over this manure every day. That manure is left there until spring. We plow our ground for our corn, we spread this ground with this manure, which by this time is in a decomposed state. We take our disk harrow and disk this into the ground, thoroughly harrowing, and then plant our corn. At our last cultivation we put on about eight quarts of alfalfa and a little red and a little alsike clover. That gives us the nitrogen to our soil, and this rock is analyzed by the State College of Pennsylvania as giving about 28 per cent. of phosphoric acid.

The Chairman: The time has expired for this and we have got Dr. McCasky, of Lancaster County, who is Chairman of the Board of Supervisors of his township, and who shall speak to us on the road question. I have the pleasure of introducing to you ladies and gentlemen Dr. McCaskey, of Lancaster.

Dr. McCaskey: Mr. Chairman, ladies and gentlemen: When I heard that the question of roads was to brought up before this meeting I felt rather reluctant at first to come before a body such as this, and I thought possibly there might be some remarks which might be helpful because of personal acquaintanceship with this subject at first hand. You know the value of good roads; everybody knows it. We have been reading about them for many years, and we all know what it means to be able to drive over a road that is smooth, well crowned, hard and that will carry us without any difficulties during the months of spring, and we also know what it means to go over a road that is full of ruts, large, deep sink holes, and with dangerous, deep spots that you cannot sometimes get through at all. What we are particularly interested in, is how are we going to get them any better. Now, there are quite a number of ways that this matter might be considered. The other day a measure was introduced into our legislature providing for a great sum of money to be appropriated, and for quite a radical reorganization of our State Highway Department. Well, now, gentlemen, all these things are very important, and very valuable, but I don't thing we want to wait until the State is going to do all of it for us. I think we can do a great deal for ourselves, and I am going to sketch in just a few words exactly what I did, and you can draw your own conclusions as to what you can do in your own township. I live about seven miles east of Lancaster. The township is East Lampeter. I am a practicing country doctor there, and I used to have four horses and seven years ago I got an automobile, and I followed one automobile with two automobiles, and there was a road that I used three, four or five times a day, yellow, soggy clay in the spring time, and after every heavy rain. It had been neglected. There had been no attention paid to its drainage, and the first principles of road construction had been absolutely ignored, but there was the road. It had its ruts and had great, big depressions, and the water after every rain would stay in the middle of the road, and every time we had a freezing spell there it would be, and in some places that road as it would come out of the spring time weather would be at least one and a half feet deep with nothing but yellow, soggy clay. Everybody knows what that means. I used to drive this road because I had to, but I thought there was certainly some better condition we could bring about. I was paying my road taxes like anybody else, and I was paying pretty handsome taxes, and I appealed to my supervisors. I said, "Gentlemen, this road is quite heavily used and as a farmer and taxpayer of this community and taking into consideration the professional interest affected, I respectfully ask if you won't do something to help me out?" Well, they said it is just as good as before; we always fix it in the spring, and we will fix it next spring. Well, things went along and nothing was doing, and I requested these supervisors to let me take them over the road personally. I wanted them to get stuck in that rut with me and then help me dig myself out. No, they would not do that; they did not feel that it was their public duty to be particularly interested in going over the roads at bad seasons of the year, so they refused. So I got a camera and I took a number of photographs as the road was in different weeks and in different seasons, and I ran the photographs over a period of a year, and the outcome of it was that as I got interested in this road subject I heard about a split road drag invented by a man named King out in Missouri, and any old port in a storm, and so I put the drag to work and, gentlemen, that drag worked a revelation in a few hours. I could not get anybody to drive it for me; everybody was skeptical; "the drag is no good; it is a cranky contrivance, and we won't help you." That was the general sentiment of the neighborhood. So I sold all my horses and so I had nothing but my automobile, and I went out on the market and I rented my team. I said, all right, I will get teams. I paid my money and my neighbors charged me for the use of my team, the same people that used the road that I did. I put that drag to work and after a few hours I got the road smooth, and filled in the ruts, and a lot of the mud got into the larger holes and these too practically filled up, and in consequence everybody drove that road. And then they said, well, maybe there is something in that road drag. We will withhold our judgment for a little while and see what it will do further. I stuck to it and dragged the road in the following spring from the beginning of March to the beginning of May, and, gentlemen, that road was as nicely crowned as could be, the side gutters were clean and smooth and the road was firm all over, and after every rain instead of the mud being three to four inches deep, an having big side puddles and dangerous, deep holes, it was simply an inch or two and dried off in a few hours. Well, that worked a miracle. Farmers that drove that road therebefore would get stuck with coal teams and lumber teams and when they went to the railroad station with their oats, wheat and for supplies generally, and they would get stuck in the mud, and after dragging the road they didn't get stuck any more. That is what I think we all can do. If any of you men are dissatisfied with the roads any more than I was and you cannot get the local officials to fix it for you, get a drag. Get a railroad tie and hitch your team to it. You have all seen pictures of this road drag. If you have not you can readily find out by writing the public road department at Washington how to rig one up. Hitch your team to that drag and try it yourselves just once, within a few hours after a rain when the road is moist, but not too soggy, and see what it will do. You will be satisfied that it will be a good investment. Now, that is what I am getting to. The very fact that you yourself would do this sort of thing will not be looked on with favor by the men whom you have elected as your road officials. They will think it will reflect on them, and it does. It will make them sit up and try to get the road put in better shape. They will inquire about it; they will learn about their duty and, gentlemen, that is really the solution of this country road problem. We are not going to get all this State aid at once, and supposing we did get a great, large sum of money, what are you going to do with it? We have road officials. I am one of them. We do not know how to plan out all to the best advantage. The fact that we get ten or one hundred thousand dollars does not mean that we are going to get roads faster by that appropriation. Now, the fact is that the course of things is to plan how with the dollar you are going to get a dollar's worth of work. We will learn that by studying our duty, and this is really the solution of the road problem, and as you learn the supervisors will gradually take more interest in their duties. Then you get them more and more interested and as the supervisors see that you are determined that they must give a better standard of work, they will give it. People are not going to fall all over themselves to work unless you want them to. It is a good deal like calling the doctor at night when there is no money on hand for the fee. The doctor wants to be sure first he is going to get his fee. And as we hear and read so much about State aid and State appropriations for our roads, please don't forget that the State, while it will do a great deal, cannot do it all, and please don't forget that we in each of our local townships can do a great deal. If you want to mix up with the road officials if they get obstinate, mix up with them. That will not hurt. See that there is some system injected into their work. Find out if they have a map of the roads in their township. Suppose you inquired in Harrisburg if there is a map of Harrisburg and the people say, no, we don't need any. We are going to save that expense. You would not think much of the town. If upon making inquiry of your road officials you should find there is no map of the township, how are they going to do the best work when you cannot figure out where the roads are. There is a point I want to emphasize: As you men go about the township make inquiry of the road officials as to things of this sort, see if there is a map and if not, see that they get one. Where are they to get one? We have the State Highway Department at Harrisburg. You can get it. It won't cost the township one cent for it. If the road officials see you are talking of them and that if they don't move you are going to move them; they will move and you will get your roads.

Now, with the map you can begin to devise a local system whereby the roads that radiate into their central points—take in my own county where the farmers drive into the town and deliver their milk each morning, or near a railroad center where they drive for their lumber and supplies—all these sections on that map could be well drawn and the system can be devised whereby certain sections of road will be let out by contract and the man that takes a contract for the job will be held responsible for that section. The supervisors can arrange to pay him good money and you will get your roads. Now, gentlemen, these are some of the things we can do. I am not interested in this road matter any more than simply because I had to make myself interested in it for my own good. If I had not been interested in it I would have had to give up my automobiles long ago because I could not go out there.

Please don't wait until the State has to do all this, because the State cannot do it all. These are just a few points in passing, gentlemen. This subject is very big. The supervisor has a great deal of authority. He is an autocrat if he wants to be. If you are blocking up a side gutter where you want to drive in with your hay team and you are spoiling the flow of water and you are damming back the flow of water you will compel that water to flow on the road, and if the supervisor comes along and says, Mr. Jones, you want to open this ditch, and you say, well, you can't open it; this is the way it has been for a good many years and I want to use this driveway, and I don't want you to open it. What are you going to do about it? The supervisor can just do exactly as he pleases. He can open it or not open it. The nicest way would be to say, Mr. Jones, that water course must be opened; if you do not want to get a pipe and put it in there, let the township put that pipe in for you and you pay the bill for the pipe and the township pay the bill for the labor. Otherwise the township is going to open up that ditch and you won't have anything at all. What are you going to do? The man may say, I am going to sue you. If he does sue he will not get anything because the law authorizes and empowers the supervisors to open up water courses and remove any obstacles from them.

I could go on for an hour or two hours on this subject, but, Mr. Chairman, I don't want to take any more of this time.

Please don't wait for the State to do it all; the State cannot. Don't jump all over the State Highway Department because you have not got it already. Don't crawl all over the supervisor when he is disposed to do something besides promises. If you see a supervisor at work or out inspecting his roads on a bad, rainy day and seeing where to make improvements, follow him and see whether he makes them and if he does back him up and you will get roads quickly, gentlemen, with a little cooperation of that kind. If necessary, take your coat off and help and you will get roads quicker with a little co-operation like that than by criticizing and not doing anything. Now, there is an old proverb: 'It is better to be 60 per cent. right and do something than to be 100 per cent, perfect and sit on the fence and criticize." I am for the 60 per cent. man every time because he helps and where I am 40 per cent. wrong there is always somebody else can supplement my mistakes and we get our roads.

These are just a few ideas, gentlemen, and I am sure, Mr. Chairman, it has been quite a pleasure for me to address this meeting. (Applause.)

Mr. Reikert: Do you think it would be feasible to contract portions of these State roads out, having them dragged with teams by contract?

Dr. McCaskey: It is not only feasible, sir, but being done with the greatest economy and greatest of success in my township, which is divided into three divisions. Each division is put under the charge of one supervisor. I am in charge of one division. As soon as I was on the job I figured out my mileage and I put one mile under the charge of one man. I hired nine men, making contracts with them personally, gave a King drag to each man and told him what I wanted him to do and told him not to mind what his neighbor was was doing; mind his own affairs, which he does. We pay him forty cents an hour and they do the work and there is no trouble about charging overtime or undertime. They are a good bunch of men that want to do the right thing. I make it my business to make a regular inspection each week and once a month I make a report as to what each man does and if he does not do the right thing I jack him up.

A Member: How long does it take to drag a mile of road?

Dr. McCaskey: It takes about an hour. Where a road drag is started in an undragged section it will take possibly the first four or five times two hours; but after the road is started, after it gets its beginning it will take about an hour.

A Member: How often do you drag that mile of road, after every rain?

Dr. McCaskey: When the surface water that can has run off and the road has gotten the proper consistency. It is best to use the drag when the soil is moist but not sticky.

A Member: You would not advocate to put these drags on in the spring when it first thaws out?

Dr. McCaskey: No, sir.

A Member: Not as long as there is frost in the ground?

Dr. McCaskey: I would not say that on a road that had been dragged, but I would not begin until then on an undragged road. For instance, some of my roads that I have been dragging for a year or two, in the middle of the day when the frost is out of the ground for just an inch I put the drag on and that fills in the little depressions of the horses' hoofs and where the ground was soft, so that it freezes up smooth and firm and the road dries out quickly.

A Member: How about dragging a road when the snow is on the ground?

Dr. McCaskey: Any time of the year when the ground has the right consistency. Where a road has never been dragged before it won't do as much good as on a road dragged for a year.

A Member: Did I understand you to say that you used a railroad tie for a drag or a steel drag?

Dr. McCaskey: I just made that suggestion rather than do nothing at all; rather than not dragging your road at all you can get a better road by using a railroad tie than in doing nothing.

A Member: We have a drag at home. Do you ride this drag; stand on it?

Dr. McCaskey: Yes, sir; always stand up front.

A Member: Near the ditch end and front?

Dr. McCaskey: Yes, and then look out you don't fall off.

A Member: How many runs do you make with the drag—one or two?

Dr. McCaskey: Make three if necessary. One will usually do after you have the road started.

A Member: Where do you get your drags?

Dr. McCaskey: Make them. If you cannot make them send up to Mr. Hunter, at the State Highway Department, and he will send you a bulletin telling how to make them, or get a railroad tie and start in. It is simple, gentlemen. But the point that I want to emphasize is, don't wait for the State to do all this; the State is going to do a lot, but you can do a lot now.

Are there any more questions?

The Chairman: We will hardly have any more time to devote to this question now, although it is a question we would like to exhaust. We have two more subjects to take up tonight.

A Member: I was wondering why the gentleman speaking on the road question was so lenient with the supervisors. I happen to come from one of the most mountainous counties in Pennsylvania and we up there have gone to the expense of buying a stone crusher and a road scraper. They cost $2,500. We have several plank drags we are using and we have not got an abundance of taxes to work with. I think our valuation runs $320,000 for the township and according to the law we can lay a ten-mill tax, so you can figure out what we get. But the question is that the money we raise don't go to the right place, and we are not wholly responsible for that, and the only way we think is to have the State come to our assistance and they can do it. Those who are from Luzerne county may have noticed in the papers this last month of the way in which our road taxes goes. I was sued and had two damage suits go to the court. We have forty-seven miles of road and have a survey map and much of that road is in such a shape that the law requires a railing for inebriated men and careless drivers. We have many corporate interests in our county and there is a feeling engendered among most of the people that it is only right to get a crack at the municipality in damage suits. As a result of that, if we have a case brought up from spite work or negligence or anything we are up against it. I know of a case where a man drove off the end of a bridge because he was careless and, gentlemen, under the law he collected damages for the accident where he should have been more prudent himself. What is costs to put up these rails we could pay with the taxes if we did not have to pay out the money for these lamages and we have many miles of rails now. The law was intended for good and for the right kind of people, but was abused in Luzerne county. There is a miscarriage of justice. These costs have been put on the township and the taxes have been compelled to go in that way instead of being put on the roads to do good. In Slayman Township, across the river from me, a man, who was an Assemblyman of this State and afterwards served a term in the penitentiary for distilling illicit whiskey, owned a farm along the river, and at the heighth of the bicycle craze the bicycle club obtained permission of the township officials to build a bicycle path six feet wide on the edge of the bank. This gentleman I am speaking about owns a fine horse and instead of driving in the roadbed he would show his mean pirnciple and drive in the bicycle club roadway that they had built there and maintained at their own expense. I am getting to the point where you will take notice a bit. One day he drove too close to the edge of the bank and went down over it and then an ambulance-chasing attorney came to him and took up his case on commission, sued Slayman Township for $5,000 and got $2,500 damages that should have gone to build roads in Slayman Township. We don't want very much of that up in Luzerne Township. I believe that there should be some protection where there is ahighway placed on the road to keep that man who is prudent and stays sober from slipping off the bank, and I do not believe there is anything better or more lasting than a sloping ridge at that side of the road that will stay there and be there for twenty-five years, and have that law repealed that makes it necessary that you put up a lot of railing for fellows who are not prudent enough to keep on the road and use judgment enough to stay on the safe side of drive.

(Applause.)

The Chairman: Is Mr. M. H. McCallum in the audience?

Ladies and Gentlemen, Professor Agee was the first man on the list to speak on "Alfalfa," but he had to leave us last night and Mr. McCallum is second.

I have the pleasure of introducing to you Mr. M. H. McCallum, of Wernersville, Pa., who will talk on "Alfalfa in Pennsylvania."

"ALFALFA IN PENNSYLVANIA."

By M. H. McCallum, Wernersville, Pa.

Ladies and Gentlemen: The subject of "Alfalfa" is quite an interesting one to me and I have had to do with it for eight years now and dare say that the last year has been one of the most interesting years that I have had the experience of growing it, from the standpoint of value as a food. Now, the time that I am to speak to you on this subject is very short, I have been told by the chairman, and in the few minutes I have I shall try to confine myself only to a few of the most important phases of the subject. I should like to speak to you of its great value as a food for the dairy and practically all animals upon the farm, and I should like to tell you of the essentials in the growing of the crop, and I should like to speak to you of the methods of making hay; but I shall have to forget all these in order to confine myself to the limited time, and I shall speak in the few minutes that are allotted to me of alfalfa in short rotation.

I believe that the farmers are coming very fast to the time when they appreciate the requirements of a crop, that they more fully realize the likes and dislikes, and it is only when we come into this knowledge that we appreciate the value of this crop. I wish that I might be able to picture tonight in words and give expression to my enthusiasm just along this line, but this will be impossible; but I shall in a few words try to tell you of the crop in short rotation, for I thououghly believe in short rotation: First of all because of the turning down of the sod. I don't like to leave it standing longer than three years. I used to leave it stand just as long as I possibly could on account of the weeds and I have had it stand for four and five years, but I believe that the limit of time is the three years when it comes to get plowed, and it is tough enough then. It is all that three good mules can do to turn down a good alfalfa sod when three years old. For this reason then I don't like to leave it stand longer than that. I have had the experience of turning down an older sod and it is almost an impossibility, and so on this account I do not like to leave it stand longer than three years. Then, again, I like to think of it and compare alfalfa with red clover in rotation, because I believe the time is fast coming when alfalfa will, to a great degree, take the place of red clover. However, I am surprised even at the present time to notice the slowness with which the farmers of Pennsylvania are taking hold of such a valuable plant as alfalfa, but I believe the time is coming, and it is coming rapidly, when it will take the place of red clover, because when we compare the value of both plants, both crops, first of all withthe humus, the vegetable matter that each crop gives to the soil. Now, just this last fall I had the opportunity of comparing very favorably a three-years' stand of alfalfa with that of red clover. I just went over the one field and after having plowed the alfalfa sod I went with the men to the red clover sod and I wish I just could give you the difference in the vegetable matter that is turned into the soil from the alfalfa sod as compared with the red clover sod. And on this account, the great difference, the immense amount of vegetable matter we have from the alfalfa compared with red clover is very striking. Then, again, I like to have the rotation short in alfalfa because of the value that I get from turning a sod down each fall. My method is this: In the fall of each year I sow about twenty acres and turn that many acres down each fall, leaving it stand three years. Now, then, when I turn down a sod in the fall, for instance twenty acres, I am turning down part at least of these twenty acres with the fourth cutting. I only use about half of these twenty acres to soil my cattle up to the first of September, and in that way I have soiled my cattle up with the exception of two weeks—I am soiling sixty head—and these two weeks I might have supplied the alfalfa as well. And now I make only three cuttings for hay and the fourth cutting, one-half of it, I use in feeding from about the 15th of September until the 1st of November, and if you are not going to turn down the sod you don't have that corn feed from the middle of September on to the 1st of November, because you dare not cut alfalfa in my country after the 15th of September with safety. There is no important point in cutting alfalfa. We should not cut it if we wish to save the crop for another year, too close to winter. And so I have this advantage when I turn down the sod I can soil my cattle up to the 1st of November, which otherwise I could not. And, then, I have the advantage of turning down on these twenty acres a great amount of humus or vegetable matter. Now, I took from twenty acres this summer an average of six tons to the acre, from twenty acres in three cuttings. Now that was this one good result, but that came from the garden spots of the farm of 500 acres; that was the best soil I had. And, now, after taking off three cuttings of six tons to the acre I was able to turn down a sod of say, I believe, fifteen to eighteen inches at least, maybe twenty inches; and that amount of vegetable matter with the root system that the alfalfa gives. I tell you there is something going to be done when you turn down a substance like that. So that I thoroughly believe in short rotation on this account, because it adds to our soil more organic matter, more vegetable matter, gives more humus, and that is what we want in our eastern soil.

Then, again, I believe in short rotation because of the sod or the root system that we turn up in these few years' growth, the long tap roots that go down into the subsoil. Now this fall, when I plowed these twenty acres of three years' standing, the plow brought up roots that had gone down into the subsoil from fifteen to eighteen inches, mind you, fifteen to eighteen inches into the subsoil, and pulled them up out of the subsoil and deposited them in the upper layer of surface soil where the shallow crops can get hold of them. These food roots puncture that subsoil and when plowed add that plant food to the surface layer. I wish you could compare the root system of the alfalfa with the root system of the red clover. I have had results along this line. I have been able to grow potatoes and grow corn on sod that has been turneddown from the alfalfa sod and, friends, we may know something of the value of alfalfa as a food, but I say we don't appreciate at the present time the great value of this plant to our soils. We have yet a lot to learn along that line; but I say the time is fast coming when we will appreciate this more. I have had potatoes upon this sod and corn, and years when conditions were unfavorable I have had as high as twenty bushels more to the acre with the same tillage, the same planting and the same conditions practically all through, and I could see throughout the season I was going to get better results from the alfalfa as compared with the red clover. With the little experience I have had along this line I am enthusiastic over the outcome of this crop, what it is bound to give along this line.

I should be pleased to take up more time in the discussion of this subject, and present it from the standpoint of value as a feed, because I have had lots of good experience along this line, but I am more enthusiastic now because of the results that I have obtained just along the line of the value to our soil as a soil reviver and soil vigorator, and the man who plants it should look to this not only as selecting one of the best foods for his cattle and animals, but he can stand assured that it is going to be a great benefit to his soil as well.

I thank you for your attention. (Applause.)

The Chairman: We have another talk on this subject. Better let the other gentleman speak and then have the questions. It is not justice to the man who is to follow to have the questions now.

The next on the program is an address on "Alfalfa in Pennsylvania," by Mr. P. P. Gheen, of Overlook Farm, Willow Grove, Pa. I now have the pleasure of introducing you to Mr. Gheen.

Mr. Gheen: I don't think the man who spoke ahead of me is half as enthusiastic about alfalfa as I am. I don't think there is a man living in in Pennsylvania as enthusiastic as I am about it.

Mr. Gheen then delivered his address as follows:

"ALFALFA."

Mr. P. P. Gheen, Willow Grove, Pa.

What is it?

It is a leguminous plant and in reckoning its value, we cannot compute its value to argriculture.

We have record that it existed in Central Asia 490 B. C.

But in using the common sense view, we have, no doubt that after the third day, that God said, "Let there be light—there was light" that alfalfa as well as all other things existed.

From Central Asia it was carried into Greece.

From Greece to Rome—to Northern Africa—to Spain—

And thence to the Western Hemisphere.

Its name is Arabic, meaning best fodder.

And we feel that it has never belied its name.

Alfalfa in Pennsylvania and what it will do is what is interesting to us.

It is only a few years since it was introduced, and behold the multitude today that stand criterions to its culture.

There seems to be an unwarranted alarm that our soils are not adapted to it.

That we need inoculation.

That our July and August suns destroy it.

That it is not worth the effort it takes to get it.

Now we will take exceptions to any man who says it is a failure for us, and prove to him conclusively that it is one of the necessary adjuncts to successful agriculture and dairy husbandry.

Allow me the privilege of another assertion, if you please, sir.

That we, the people of Pennsylvania, can produce anything that will grow in a temperate zone as good as can be grown in the world if the right man is behind the gun.

We don't turn our backs to Kansas for bushel corn, nor the Dakotas for bushel wheat. Neither to any other place for any product of the soil in quantity or quality.

More than that, we have within easy access four of the best markets of the world.

The question has been asked many a time to my knowledge, "What piece of ground shall I select to grow alfalfa?"

Select ground of an upland nature with good natural drainage, sandy subsoil that is not water-logged, and various other instruction that the average man would forget one-half of before home was reached.

The following question:—

How shall I prepare my ground for the seed?

They would be instructed to plow, harrow, disk, roll, etc., not called for in any sense whatever to the average intelilgent farmer.

Then it would be followed with the third question:—

"How shall I fertilize?"

Lime abundantly.

Fertilize with complete fertilized lime the second year, etc., until the instruction the applicant had received would seem of such magnitude that he would abandon the project of alfalfa culture forever.

Gentlemen: If you contemplate alfalfa culture in the short way, permit me to explain how I have seen successful results:

Select from your soils any piece of land that you know will grow common red clover, and it is a fact that where one will grow so will the other.

In your selection you can take any piece of land you think is not giving the proper return from prior crops.

Plow and cultivate thoroughly by July 15th.

It is very necessary that this should be thoroughly limed with fresh slacked lime at this time, following with thorough cultivation until August 10th.

If you will treat your land liberally to cultivation before seeding, it is a plant that responds very quickly and you will reap handsome returns from the expenditure you have made.

With your permission I would like to say something in reference to cultivation of any crop at this point.

It is not a fact that we people, meaning farmers, attempt to do too much with too little.

It is very vivid in my mind that our soils are like the college man's brain.

You take the average college man, load his brain to the uttermost. Grant his diploma and turn him into the world to earn a livelihood at the mercantile business.

What will become of all the scientific training that brain has had?

To a great extent it will flourish and fade away, profiting the world nothing.

Where, on the other hand, if that scientific training is cultivated it will expand to the credit of the individual, showing the world the necessity of cultivation.

It is just as necessary for us to cultivate our soils to the uttermost, that the fibrous roots of the plant life may permeate every part of such that we may derive the whole benefit contained therein, and reap handsome returns therefrom besides the satisfaction of mind that the work was well done.

Returning to my subject:—

Be careful in the selection of your seed.

Make the attempt to sow on August 15th, or as soon after as possible, at the rate of eight pounds alfalfa, eight pounds common red clover to the acre, sown with broadcaster and harrowed in with a sixty-tooth harrow.

Sow fourteen quarts of timothy seed the opposite direction. Treat likewise with the harrow. The following year you will have red clover and alfalfa first crop.

Then two cuttings of alfalfa.

The next year first crop you will have a fine stand of timothy.

The two cuttings of alfalfa.

You now have your ground inoculated ready for alfalfa alone.

If your red clover fails at the sowing, so will the alfalfa.

The bacteria that cultures red colver cultures the alfalfa.

Too much cannot be said of the value of alfalfa.

They are to be divided into several classes.

The feeding value of alfalfa is about on the same basis as winter wheat bran containing twenty-seven per cent protein.

This value needs no explanation.

The second value is nitrogen gathering propetries leaving the soil in a better condition each succeeding crop, depositing on its roots through its leaf surface the most expensive fertilizer known to agriculture.

The third value is the amount of nitrogen gathered in proportion to any of its sister clovers.

The leaf surface of a thrifty stalk of alfalfa is about double that of common red clover.

The fourth value is the excrement from alfalfa fed stock contains about double the amount of nitrogen, potash, phosphoric acid as that from other fodder or hay.

Its fifth value is that once a stand is porcured you need have no concern for at least four years.

Its life is about double the time of average red clover as its life in two years.

About four times the life of Alseke.

Thus it is a great labor saver in this respect.

Its sixth value,—You rarely see noxious weeds in a field of alfalfa.

The constant cutting it will stand destroys other plant life.

This point makes it very valuable.

I have in mind a field ten years ago with an excellent stand.

Garlic sown to alfalfa and resown in four years.

The garlic at this time is gone and everything else of noxious weed kind.

It is not worth my while to tell anything more of its feeding value.

But, I will state one thing accomplished in the summer season of 1909.

The party had a dairy of eight cows.

The drought began June 15th and lasted until the alfalfa season was done.

By good feeding of green alfalfa each day from June 15th to October 15th the product of that dairy was increased $1,980 over any other year they were ever in business corresponding with the same period of the corresponding year.

With your permission I will state another fact accomplished with green alfalfa.

In the Spring of 1910 I saw chickens fed on Otto Weiss Chick Feed, sour milk, cut short green alfalfa make two and one-half weight in sixty-three days, with chickens worth forty cents per pound.

These are facts and not idle talk.

I know whereof I speak. And if the gentlemen who tries alfalfa and fails the first time will keep these few lines in front of him, commit to memory and report to his neighbor, they will sound like this and he will try again:

If you strike a thorn or rose,
Keep a-goin'!
If it hails or if it snows,
Keep a-goin'!
'Tain't no use to sit and whine
When the fish ain't on your line,
Bait your hook and keep on tryin',
Keep a-goin'!

I have seen horses leave No. 1 Western clipped oats to eat second-crop alfalfa. The animal can tell us which is best.

I have seen dairy cows leave No. 1 Buffalo Gluten to partake of green alfalfa.

In fact, it is feed for the soil, for the animal, and for the owner's bank account.

In conclusion, I would encourage any man who owns ground that will grow common red clover to begin with alfalfa at once, and after he has harvested his first crops and burned the following winter's fire wood, it will not take an uncultured farmer like myself to explain the advantage derived therefrom.

The Chairman: Now fire in your questions.

A Member: Do you find it necessary to put fertilizer on your alfalfa after you have got a stand, after the first year?

Mr. Gheen: No, sir; I treat it pretty liberally to nitrogen in the start, the moment I sow it. After that I never put anything on, and I follow out the same rule as the gentleman ahead: I let it stand four years. But I think three years nearer the right time.

The Member: You don't put manure or fertilizer on?

Mr. Gheen: Nothing after sowing; don't put anything on the ground during the three years.

A Member: How do you judge by the character of the plant so that you can make it last as long as possible, in cutting?

Mr. Gheen: If the strength is in the plant, just before it comes into bloom, that is about the time to cut for hay or anything else.

The Member: Then how long do you let it go?

Mr. Gheen: I would say cut again just before coming into bloom again.

A Member: I understood you to say that the red clover inoculates the soil?

Mr. Gheen: Yes, sir. The United States government put out a bulletin about eight or nine years ago. They said that the bacteria that would culture one would culture the other, and the similarity was so great they could not tell the difference; and that is what started me to grow red clover and alfalfa together.

A Member: I should like to take exceptions to what Mr. Green said about red clover. I stand for all kind of clovers and red clover will gather as much nitrogen and you can find as many nodules of nitrogen on the roots in proportion to the leaf surface as you can on the alfalfa.

Mr. McCallum: In regard to the bacteria being the same in both plants, alfalfa and red clover—now, if that is the case, why, my experience is very wrong. My first experience was a nine-acre field and I had no faith in the inoculation. That was humbug to me, yet I had faith enough to go to my father-in-law's field and get half a peck of soil and inoculate a small portion of about thirty square feet. Now, then, gentlemen, I have been growing red clover and the farmer preceding me had been growing red clover successfully on that field and on all the fields. Now then, that field the first fall after sowing had a beautiful stand and the alfalfa came up bright and early and a beautiful stand the next spring and along about the middle of April about three-fourths of that field began to get yellow and that little spot of thirty feet square was just as nice and green as possible, the part of the field that I had inoculated with the half-peck of soil, and three-fourths of that field turned yellow. The other one-fourth was naturally inoculated, what I considered naturally inoculated. If it is the same species of bacteria in red clover I don't understand why that entire field was not inoculated.

Mr. Gheen: I remember when we ha da meeting in the Market House two years ago a distinguished gentleman from New Jersey told you what I told you tonight, that the bacteria that grew one would grow the other, and that is the way they are going at it in New Jersey.

A Member: Did he not speak about sweet clover?

Mr. Gheen: That he did. But I called his attention to it as soon as the meeting was over and he said that where one would grow the other would grow, and I asked him about red clover and he told me that afterwards, and I am positive of that that where one will grow the other will grow on fair soil.

H. D. Connell: You spoke of using alfalfa in four-year rotation. What has been the custom and the crop that you followed the alfalfa with?

Mr. Gheen: I have no particular piece of ground, taking any piece of ground that will produce red clover. If rye stubble, I take it; if an old timothy sod, I take it. I take any piece of bround.

Mr. Connell: In other words, I would like you to suggest in following a rotation of potatoes, some of them being a little late, how would you suggest preparing that soil for alfalfa?

Mr. Gheen: It is too late after potatoes to sow alfalfa. You want to get your seed in there in time to have the proper top to stand the winter. If seeded in August it will have a root ten to twelve inches long before winter and will withstand the frost.

Mr. Connell: Would you recommend following early potatoes?

Mr. Gheen: You would want your potatoes out of the ground by August 1st, so that the ground is thoroughly cultivated. If you sow later than August 15th you will not get sufficient growth before winter sets in. That is where the mistake is.

Mr. Bayard: You all see this gentleman taking shorthand notes. That is done for a purpose and that purpose is to put all this matter in our annual reports, and the way for you to get these discussions and keep them by you is to become members of this Association, either the Dairy Union or Breeders' Association. Become members and get your annual reports and keep them and you will have something and you will want more of them. It will cost you one dollar a year—and we need the money!

The Chairman: Anything more on the alfalfa question?

A Member: We sow after wheat. When we have taken the crop of wheat off we seed the alfalfa after that and have had good success. We are now growing thirty-two acres.

Mr. Comfort: I think there is a point people want to understand. Different people have failed in growing alfalfa when they have got their ground in perfect condition because their ground was so mellow so deep down. I have in mind cases of this kind where the farmers afterwards took their wheat stubble ground, the ground that had been simply cut with the cutaway harrows, getting a shallow, mellow seed bed, and they got perfect success; where after potatoes with the ground tilled and worked all the time they failed unless the rains were very favorable. They got their seed bed so that it will hold the moisture where the seed bed after potatoes is often too mellow. Last year I know of one piece that was sowed where there had been potatoes and perfectly fine ground, and heavily manured; and in the same field another piece after their oats. There had been no rain for twenty-two days; but there was a fine set after their oats, but not more than one-third of the seed germinated after their potatoes. I have known where they have failed by their very fine seed bed, deep plowed and worked and replowed, where they succeeded by taking the wheat stubble ground and simply disking with Clark's cutaway harrow and then sowing the seed on the 15th of August.

A Member: Would not rolling have corrected that?

Mr. Comfort: No, I don't believe it would.

Mr. Shrum: I have a small piece of alfalfa I started on corn stubble ground in the winter. We top dressed it with manure and we plowed in the spring as soon as fit for plowing and limed it then and kept on harrowing until July and sowed the alfalfa and the next year we got three cuttings. After cutting the last crop we gave it a dressing of manure with the spreader, and gave a light dressing and got almost as much in the first crop this summer as we had the three cuttings the first summer. I believe the dressing of manure helped it. I did not do any inoculating.

The Chairman: There is one thing I have found out. Whenever you want to wake a meeting up you take up the alfalfa question.

Tomorrow morning there will be a symposium on the "Cost of Milk Production." There is another live subject and we have got to have you here promptly on time as we wish to close up tomorrow forenoon. After the symposium will be the reports of committees and new business and election of officers. I think if there is nothing more we will adjourn until tomorrow morning at 9:30 o'clock. Adjourned.

REPORTS OF COMMITTEES

Mr. Norton: Gentlemen, we have a resolution here, presented by the Resolution Committee of the Pennsylvania Live Stock Breeders' Association, which is as follows:

RESOLVED, That we, the Live Stock Breeders' Association of Pennsylvania, urge upon our Legislative Representatives (now in session) the importance and value of a State Fair to the industrial, commercial and agricultural interests of all our people, and that we as an Association hereby respectfully request the Legislature to pass a State Fair Bill to be presented at the present session. That the Secretary be instructed to mail a copy of this resolution to the members of the Senate and House of Representatives.

The Chairman: Gentlemen, you have heard the resolution. What is your pleasure?

Secretary Critchfield: I move the adoption of the resolution as read.

The motion was seconded, put and carried.

The Chairman: The next will be the report of the Nominating Committee of the State Live Stock Breeders' Association.

Mr. Perham: Your Nominating Committee have left and turned their report over to me. It is as follows:

Report of the Nominating Committee

President—Hon. W. C. Norton, Waymart.

Vice President—Dr. C. J. Marshall, Philadelphia.

Second Vice President—Hon. M. P. Shoemaker, Greensburg.

Secretary—E. S. Bayard, Pittsburgh.

Treasurer—J. F. Lantz, Wyebrooke.

Executive Committee—Dr. C. J. Marshall, Philadelphia; D. W. App, Sellingsgrove; James Blair, Hartstown; Henry Palmer, Avondale; W. F. Shrum, Adamsburg; W. M. McCoy.

Legislation—Hon. W. C. Norton, E. S. Bayard, Dr. C. T. Gay, Dr. Thomas Turnbull, H. W. Comfort, J. H. Reichert, W. E. Perham, Hon. M. P. Shoemaker, Greensburg.

The Chairman: What action will you take upon the report?

Secretary Critchfield: I would inquire whether there is more than one person named for more than one place?

Mr. Perham: There is not.

Secretary Critchfield: I move you then that Mr. Perham be instructed to cast the ballot for the persons whose names have been presented by the Committee on Nominations.

The motion was seconded, put and carried.

Mr. Perham: Mr. Chairman, in accordance with the instructions, I cast the ballot for the persons named for the persons named for the respective offices by the Committee on Nomination.

Mr. Norton: There is one report yet, the report of the Auditing Committee, but I see none of the committee here. Mr. Shoemaker cannot be here to make the report and as we have been paying out bills all during the meeting they will be included in the report.

I think there is no more business before you.

I thank you for the honor, for I consider it an honor to be elected President of the Pennsylvania State Live Stock Breeders' Association. I think this is the eleventh time. I will try to do my duty in the interest and for the welfare of the breeding interests of this State, and will do everything in my power to help along, but I am not unmindful of the fact that I will need your united co-operation as any one man can do but little in himself.

We will now stand adjourned.

JOINT MEETING WITH STATE BOARD OF AGRICULTURE AND DAIRY UNION

S. S. Blyholder, Vice President of Board of Agriculture, in the Chair.

The Chairman: The first topic on the program for this evening is the report of the Veterinarian of the Board, Dr. S. H. Gilliland, of Harrisburg, Pa. Is Dr. Gilliland present? He does not appear to be, so we will take up the next subject: "Permanent Pastures and Meadows," by W. D. Zinn, of Phillippi, W. Va.

I now have the honor of presenting to you Professor Zinn.

PERMANENT PASTURES AND MEADOWS

By W. D. Zinn, Phillippi, W. Va.

Ladies and Gentlemen: I think the Chairman said Professor when introducing me. I do not know whether to respond to that or not. I am a farmer, not a professor.

Friends, I am very glad to meet so many of the up-to-date farmers of Pennsylvania. I am sure you are all up-to-date farmers. They are the ones that attend the State meetings. As I look into your faces and see the interested expressions I appreciate being with you. That reminds me of a story they tell on a local preacher in my community. He always introduced his remarks like this: "My friends, I am glad to be here this morning, and I am very glad to see so many of you here." Finally he was invited to preach in the penitentiary and he began his remarks in the usual way: "My friends, I am glad to be here, and I am very glad to see so many of you here."

I am to talk a little while about Permanent Pastures. I come from an agricultural state, if you will permit me to call it such. You may think it a mountain state, a state of mountains and hills. We have them there. We do not have very much level land, and yet there are some places where you can find as many as five acres of level land unbroken by mountain or hill.

Beef From Grass.

Only recently I attended a stockmen's meeting in my own state, a unique affair. A gentleman who had been shipping cattle for about twenty years or more, shipping export cattle, gave a dinner. He had selected a show steer that he thought the best he had ever bought, and having purchased forty thousand or more, we had a real roast. I took a census of that meeting and I found those present (80 in number) represented five thousand seven hundred cattle, export cattle nearly all of them were. That is, these men there grazed that many cattle. Out of that number of cattle but twelve hundred of them were grazed during the winter; the balance were fattened on the blue grass. I make this explanation that you can understand that we have some blue grass in West Virginia, but not as much as we shall have, and we have not taken the care of it we ought. But we like blue grass, friends, because we think it is a pretty easy way to make a living, and we West Virginians don't like to work any more than we can help. We turn the cattle out in the spring and see that they have water when they want it and that is about all the work many of the farmers there do. I know of farmers keeping one hundred cattle and not paying out as much as three hundred dollars during the year for labor. I have a neighbor who was present at this meeting, and he represents six hundred export cattle that he finishes every year; and I asked him: "Do you grain any?" He replied, "No; if I cannot fatten my cattle on blue grass I will go out of the business."

The Price of Land

But I am boosting West Virginia. Our pastures are sources of great income. Sometimes when I talk to farmers in other states they say, why, land is too high to graze. You cannot afford to pasture hundred-dollar-an-acre land. Let us see if we cannot. In France today there is a lot of land that rents for ninety dollars an acre for grazing. Now, they must keep some good stock on it. The reason why we can't afford to pay the high prices for grazing land is that we do not put the right kind of stock on it. If we graze on this pasture land the kind of stock that is grazed in France, viz: high-priced breeding stock such as they ship to us and sell at fabulous prices, then we can afford to pay one hundred dollars an acre for good grazing land.

Our pastures in West Virginia, as well as in Pennsylvania, have been "running out." They don't produce as good as they did twenty-five to fifty years ago. In the meeting referred to, I asked the question: How many cattle can you carry now and how many did you carry twenty-five years ago? Some report that they only kept about one-third as many. There is something wrong. We understand at once why land runs out when farmed year after year. We know that the organic matter and the available plant food exhausted the land deficient in lime, and we have come to understand that the same thing happens with the grazing lands. Our grazing lands are deficient in organic matter and in lime, they having no available plant food, and we must take the same care of our pasture lands as of the farming lands if we want to make them keep up their productivity.

Overworking Pastures.

Now, it shall be my purpose to discuss the ways and means of doing this. We want to look upon our farms and our pasture fields as animated objects. The fact is they have or should have a great deal of life. If you take your horse and work him without feeding him for three, four or five days a week he becomes lean and weak, and if you don't begin to feed him he will die. We have been working our pasture lands for years and years and only giving them half rations and it is not any wonder they have become unproductive. Our fields must be fed; they must be clothed and taken care of just like the human body. If we fail to do that they will not give the returns they should. The old Jewish law required that the land should have all that it produced every seventh year. I don't know whether those old Jews understood scientific agriculture or not, but they were practicing it. Every seventh year all that the land produced went back to the soil. For what purpose? To feed, clothe and make available the plant food for the next six years. Friends, I think we can improve on the Jewish method if we give the soil something every year. Let some organic matter get into the soil to make plant food available and that land will be productive for years to come.

There is no excuse at all for working out land. If you do not leave your farms better for your children than when you found them, you have missed your calling in life. Our lands ought to become better; they must of necessity be more productive if the people are to be fed, because everything that we have comes from the soil and, in the future greater demands will be made upon it; for we are told in fifty years from now we are to have two hundred million people in the United States, and all these people must be fed from the soil, so we want to take better care of it and give the land its share, no matter whether farming land or grazing land. If you are a tenant farmer you can rob your landlord year after year. I think I have had tenants to treat me that way. But if you are a land owner you cannot rob the land year after year without its resenting that kind of treatment. It will simply show this is to you and say "You have not given me a square deal; you have robbed me and I don't propose longer to give you a good crop." From these pasture lands you have been driving the live stock for years. If is is a dairy farm you have been selling the milk and in that milk there is a certain amount of plant food, the three elements that are found deficient in soils: nitrogen, potash and phosphorus. Whether we sell beef, mutton or milk we are taking available plant food, especially phosphorus, from our lands. So, my friends, it is up to us to return this plant food to the soil in some way.

Need of Lime

It has been shown that many of our pasture fields have run out because the lime content is too low. There is an acid condition in the soil and it is necessary if we wish to grow good pastures to apply lime to the soil.

The question of lime is interesting a great many people at this time. We are just awakening up to the fact that nearly all of our soils are deficient in lime. Over in my state a few years ago a farmer came to me who had a limestone field of seventy acres. Lying all over it was limestone rock. His clover had failed in his field and he wanted to know what was wrong with his ground. I said, "I suspect your land is sour." He replied: "It could not be. There is limestone all over my land. It is actually in the way." I said, "Have you tested the soil for acidity? If not, test it." The man got blue litmus paper and applied it to his soil and found a great deal of acidity in it and he applied five hundred pounds of granulated lime to the acre and the next year got a fine crop of clover and has been growing clover ever since. That proved that even these limestone soils are becoming deficient in lime and we have got to apply the lime and there is nothing under the sun that will take its place. I had a letter recently from a farmer who said: "I want to plant twenty acres to corn"—that letter was from this state—"I am in doubt as to whether to use phosphoric acid or lime on the land. What would you apply?" If the land needs phosphorus there is nothing will take the place of phosphorus, and if it needs lime there is nothing to take the place of lime. Test your soil and supply what it needs. I also told him that the probabilities were that the land needed both the phosphorus and the lime, because most of the soils in our state—and that is largely true in this state—are deficient in phosphorus as well as lime. You have been selling the small grains off the farm and these grains have carried away a great deal of the phosphorus, and possibly the manure has not been saved as carefully as it should have been, and you have been losing there and the soils are all deficient in phorphorus and we must supply it.

Application of Lime

Going back to the lime question: There are various forms of lime we can use on the pasture fields. Where you have the limestone, as you have it up the valley between here and Hagerstown, all I believe you need to do is to crush that limestone and scatter it over the fields. It is the safest form in which to use lime, because you will not burn up the humus when you apply that ground limestone. There is some danger in using too much caustic lime. That burns up the humus and you deplete the soil of fertility. It will become a stimulant for the time being, but it will leave the land worse than it was at first. Be careful what kind of lime you use, especially on the pasture fields, because you don't have the chance to treat them as you might other fields, and I recommend the ground limestone for the pasture land. Lime sweetens the soil by the particles coming in contact with the particles of soil, hence it would be a great deal better and the sweetening process more perfect if you could plow that soul and mix the lime in because the contact would be more general. It may not be practical for you to plow up the field and put the lime on the top of the land. If not, you can get good results from the lime by simply sowing it over the land whether you plow or not. Sowing it on the sod will correct the acidity to some extent, but not as perfectly as if you plowed the land and applied the lime on top.

The other day I was "called" by a farmer when I said you can get too much caustic lime; he said: "I have used three hundred to four hundred bushels of caustic lime on the land and produced good crops for twenty years." I said, "How did you apply that lime?" He said: "We apply it in this way: We put it in small piles and let it lie there from two to four weeks and then scatter it over the fields." I said: "You are not applying caustic lime. That is carborate of lime." When burned lime is applied in this way it air slackes and air slacked lime is carbonate of lime. That is the reason why Pennsylvania farmers have been so successful in years past in using so much lime. They have been using carbonate of lime and did not know it; actually so, because that lime became air slacked when taken into the soil was in the form of carbonate of lime and did not burn the humus. It is dangerous, my friends, to put into the soil anything like three hundred bushels or one hundred bushels of caustic lime.

Renewing Pastures

There may be various causes why our pastures become unproductive. As I have said, they may need lime, plant food and phosphorus. The dry weather may have caused the roots to die and the worms may have killed it. I have had all these things happen to my pasture land until I absolutely had no grass. What are you going to do then? If we could plow and reseed, the problem would be easy; but that is not always practical. I am going to tell you what I did. If it suits you, you can do it; if not, you can reject it. We go on to those fields and we harrow them. If the field is smooth we take a double acting cutaway harrow and that is the best I have tried. We cut it up pretty thoroughly so there is little or no sod left. That ought to be done as early in the spring as possible, February if the ground is in proper condition for tillage; if not, later on. March will do, and April may do. May I think is too late as a rule. I put the lime on before I start the harrowing. Sometimes with the grain drill, sometimes a lime spreader and sometimes with a manure spreader. And, by the way, my friends, there is no place on the farm that I believe you can get more out of the manure per ton except the meadow than on the pasture land. I have come to this conclusion, that we have been putting the manure to the wrong crop for years. My practice formerly was to manure the corn ground directly ahead of the planting of the corn. I never do that now unless I have more manure than I need in either of these other places. I can get the most out of manure on the pasture land, meadow land or on a soil improvement crop. If you are growing rye and you want to turn that rye down to improve the land you can get more out of the manure by applying it to that land so you have a good heavy crop to turn down.

I take the manure spreader and spread manure over this pasture field. Try a small acreage at first. If you have fifty acres, try five or ten acres; cut it off from the balance of the field. I use the woven wire fence for that purpose. Apply the lime and manure if you have it. I have applied commercial fertilizer, but I will speak of that later—and then put on some grass seed. There is little or no life in that soil, no plants there, so you want to sow some seed there, and this is one very important question for the farmer to consider. Twenty-five years ago, when I was a boy, my father would send me out to sow timothy seed or sow the ground to grass and we never thought of sowing anything but timothy seed, especially for permanent pasture. I sowed about a gallon to the acre and then we waited about two or three years for it to sod up. Now it sods up the next year with weeds if you don't put useful plants there. I think timothy is a very poor plant to sow alone in the pasture. It does not last long. It is a soil robber. It feeds on the surface; still I use a little of it. I sow four pounds each of timothy orchard grass and red-top seed to the acre. I don't know what you think about orchard grass. Some farmers say they would just as soon have broom sedge, but I like any kind of grass that makes the winter shorter and orchard grass shortens the winter. It stands late in the fall and comes early in the spring. So we sow a little orchard grass. Red-top will grow in an acid soil. It will grow in a sweet soil as well. It will also grow in a wet soil. If any of that land ought to be tile drained it will pay to do it. It won't pay to grass wet land. The red-top grows in rich land, of course; all plants do. It will also grow in poor land. It makes the sod thick and for that purpose I like to mix some red-top, say four to six pounds. Then I would put in some Kentucky blue grass. It is the greatest of all grasses in the United States, and if you have plenty of lime in your land I am sure you can grow it. I sow from seven to eight pounds of Kentucky blue grass and I would be sure that the seed would grow. A good many farmers do not like to sow it because they say the seed don't grow and I want to tell you what the trouble is in many cases. In Kentucky they gather the seed with a one-horse stripper. They driver over the pasture lands in June and strip this seed off and put it in bags holding from eight to ten bushels. The farmers sell this seed often before they get it into the barn. The dealers come out from the city and buy it in the field and haul it to the railroad and ship to some warehouse and there it becomes heated and then we buy it and don't get any blue grass when we sow it. Since I have learned this I have been buying my blue grass seed directly from farmers in Kentucky, those who are responsible, and they send me good seed and I have no trouble to get it to grow.

I would not stop with that because we have not put anything in the mixture that will add any plant food to the soil. Nitrogen is the only element of plant food that we can grow in the soil, and this is gotten there by growing some legume. I will sow nearly all the clovers. I would sow at least two pounds of white perennial clover, that will stay in the land indefinitely; two pounds at least of red clover and two pounds of alsike clover. We know that alsike clover will grow in acid soil more than red clover and will stay long. It is a cross between the white and red clover and has some of the characteristics of the white clover, being almost perennial in its habits. You could mix mammoth, but these three would be sufficient. Mix these? No. Sow the clover seed by itself and the grass seen by itself. If you mix them altogether and sow, you will not get an even distribution of seed because some of the seeds are heavier than others and fly out farther. Then harrow the seed in. I believe in planting seed grass seed just as much as planting corn and there is no farmer that goes out and throws his corn on top of the ground. They always plant it, and I believe these seeds ought to be planted. A good many farmers in seeding have been losing their crimson closer. They sow it but don't get a plant. Nearly everyone, upon investigation, has sown that seed on top of the ground. It is a large seed and possibly germinates and it does not get enough moisture until it withers and dies. That ought to be harrowed in. And so with most of the seed. We should harrow them over; a brush will do; anything to stir it in; and by all means have the seed bed as good as you can get it; if you must, harrow it over several ways. There are fields in West Virginia from which grass has died out and we cannot harrow them. The only thing we can do is sow some seed over them. Some of them ought to be reforested and, in fact, I believe that some fields in Pennsylvania should be left go back to forest or have trees planted on them, locust or something else, because they are not worth taking care of and will never make good pasture lands.

Fertilizers on Grass

Now, these plants will need some fertilization, some available plant food, and before I harrow the land last time I use some commercial fertilizer, and on the character of the soil, my friends, should depend largely the kind I would use, and by kind I don't mean any brand. I am asked: "What brand of fertilizer do you use?" It does not matter about the brand. There are a great many farmers, it is true, in West Virginia who buy commercial fertilizer by the smell. If it has a strong odor they say it is the very kind of goods they are looking for. It may not be worth five dollars a ton. Again, they actually buy for color; if it has a good, dark color, that is the thing theywant. Imet one of these fellows coming from market with a load of fertilizer. I asked him what he paid for it. He said he got a confidential price on that and he promised the dealer not to give him away. I am always afraid of these confidential fellows, and I began to insist on his telling what he really paid for it.

The analysis was this: One per cent. of nitrogen, 7 per cent. of phorphorus acid and 1 per cent of potash. I figured that it was worth about ten dollars or ten dollars and sixty cents from the commercial value of phosphorus, nitrogen and potash, present value. After I had insisted that he tell me, he said he got it for nineteen dollars a ton, and that the dealer had sold it regularly for twenty dollars. I said: "You are the fellow who should not want to tell anybody. You paid two prices for fertilizer." There are a lot of farmers doing that. We are buying even what our land does not need. If this pasture lan dis heavy clay soil and has a reasonable amount of vegetable matter in it, it doesn't need potash. I don't need it on my fields. I have asked my fields what they need and this is the best test and only correct test when we askth eland. The chemist cannot tell you. He can analyze the soil and tell you how much phosphorus, nitrogen, humus and lime is there and a lot of other things, but he cannot tell you how much is available. The farmer must ascertain that himself, and I found I did not need potash and nitrogen on my soil when I asked the land what it needed by checking it and by putting on one plat the fertilizer and on the other nothing, and I found my land needed only phosphorus. I did not get any appreciable increase by applying nitrogen and potash on the clay soils. I am not speaking of sandy soils where you may need some potash. In all probability on the clay soils you need to apply only phosphorus; you may need nitrogen. And I would say after you have sown that crop you can tell to the foot where you applied the phosphorus. I put on one hundred pounds of nitrate of soda on the grass after it is started up well. That will nourish it until the roots run out and get plant food to grow it. It is one of the best things to put on the grass started on timothy meadows. The land may need nitrogen and I believe in that way by applying at the time of sowing a mixture of potash and nitrate of soda, tankage and fish scrap or something of that kind so that it gradually becomes available.

Another thing we want to remember in applying fetrilizer on plowed ground is, that potash and phosphorus become fixed at the point of contact. If you apply on top of the land and don't harrow in afterward the danger is that it will become fixed at the surface; so you want to stir the soil. I harrow thoroughly to get it down. Fixation takes place within twenty-four hours after application.

Permanent Meadows

I have said nothing about permanent meadows. How many have permanent meadows that you don't plow? I want to see if there are any farmers who have them. Quite a few. I think, myfriends ,that we ought to have just as few of them as possible. Really, I don't believe very much in permanent meadows, and yet there are farms on which we must leave a certain piece of ground to meadow indefinitely, and they must be fed like the pasture field. There is not an acre of ground that pays better on my farm than my meadow lands because they produce heavy crops of clover and timothy hay. We get from twenty to twenty-two dollars a ton for it. Some farmers have meadows they wish to maintain. Those meadows run out for the same causes that the pasture lands run out. They need feed. Some of my neighbors have been following this method: They cut up the meadows immediately after harvest and reseed, and there is no better time to do it if the season is right. The mixture they use is timothy, red-top and clover. Experiment with alsike and red clover. They sow a little commercial fertilizer because they want a good growth and we must get it ready to go into winter. If you have manure you can apply it. The farmers have been flattering themselves that they were giving back to the soil all they took from it, but they were not. They were robbing it every time by pasturing it too closely. This we ought not to do. We have been grazing too closely. When I began the business of farming I began with a mortgage and I went out and bought sheep and turned them in to the grass I had left in the fall. I would have better carried the mortgage longer. You cannot afford to graze your meadows closely. In fact, I don't believe a meadow ought to be grazed. I believe the ideal way of handling a meadow is to take the first crop off and then, unless the other crop is large, let it go back to the soil, covering up the land and making available plant food and furnishing organic matter to the soil to grow the crop next year. When we cut the hay and haul it off we should put the manure back or apply commercial fertilizer and feed that meadow. We ought not to expect it to do well unless we feed it regularly. I have a neighbor that top dresses his pasture lands every third year with acid phosphate, two hundred and fifty pounds to the acre, and he has some fine cattle and some fine pasture.

The Chairman: Have you any questions to ask Mr. Zinn? You have an opportunity to bring out any thoughts you want.

A Member: I would like to ask if you would prefer plowing to harrowing the worn-out meadows?

Mr. Zinn: Yes, sir, but I take it a great many have pasture lands you do not want to plow at all, as we have in West Virginia. I would always plow if the land was right so that itcould be plowed and prepared in that way because you can do a better job and turn under any cover crop, like plowing down some rye and increasing the organic matter in the soil. Where you cannot do that, the harrow is the next best thing.

A Member: Would you recommend the clipping of the second crop of clover or let it grow?

Mr. Zinn: I would not let it ripen the seed. When a plant ripens its seed it has fulfilled its mission in the world, and that is the reason the farmers don't get a good stand if they wait until it ripens its seed before clipping.

A Member: Certain of our permanent pasture fields become infested with growing weeds. How do you treat that?

Mr. Zinn: Now, my friends, I believe this, but I don't know whether our scientific friends will agree. I believe the soil's natural preference is to grow useful plants rather than weeds if conditions are what they should be. Weeds come because the soil often needs lime. I saw that in Ohio. A farmer had sown timothy. The field ha dbeen covered with broom sedge before that. At the time of seeding to timothy he took the manure spreader and drove promiscuously over the field and scattered the lime right and left over the field and two years after that I could see the tracks made by the horses in going over the field. There was nobroom sedge there. The lime had not driven the broom sedge out. It increased the growth of the timothy to such an extent that the broom sedge was crowded out. If there is enough available plant food in the soil we are not going to be troubled with weeds much.

A Member: What is the cheapest way to put on lime, either the hydrated, the ground limestone or burned lime?

Mr. Zinn: That depends very much on what it costs you. Hydrated lime has a wonderful reputation. The manufacturers are doing just like food manufacturers. If I was selling hydrated lime I might do as the others do. Remember, hydrated lime is forty-four per cent moisture. The only advantage over the air-slacked lime is the even fineness and in mixing the soil contact will be more perfect. If I can buy the ground limestone at one-half the caustic lime would cost me, I would say certainly use the ground limestone all the time. Sometimes we have to ship too far and then we buy caustic lime and sometimes we allow it to air slack and put in on as carbonate of lime. The distance of shipping and distance to haul has a great deal to do with it. Remember that one tone of ground limestone is the equivalent of 1,120 pounds of caustic lime, so figure on that basis the paying price.

A Member: I would like your thought on using red top, which is sometimes considered a weed.

Mr. Zinn: I like to use the red top in that timothy because it will make the timothy finer and heavier and will help to hold the weeds down. And then the second reason I use red top and other grasses in the pasture land, is that it furnishes the stock a variety of food and that is absolutely necessary. I am very fond of corn bread, but I am afraid if I had to eat it three times a day for 365 days I would get very tired of it; and so it is with the animal. It would soon tire of one food all the time. Did you ever sit on the fence and watch them eat? When they are full of grass they will bite off a weed. I want to satisfy that appetite by sowing a variety of seed and I will do that when I sow nearly everything I can get in the form of grass seed in the field.

The Chairman: Is Dr. Gilliland present? Dr. Gilliland is to make the report of the State Veterinarian, but he does not appear to be present, so we will take up the next subject on the program: "The Pennsylvania Stallion Law," by Dr. C. J. Marshall.

Dr. Marshall: Mr. Chairman and Gentlemen: I was requested sometime ago to give you something on the subject of "The Pennsylvania Stallion Law." I wondered why they asked me to speak on such a subject. I know there are a great many here that know a good deal more about the stallion law than I hope to. I have had an opportunity to be interested in it a little. I think in January, 1908, the Pennsylvania Stallion Law was instituted in this State, and it has been making good progress since it was in effect. Dr. Gay, the man who has had charge of the work, is very much interested in it and I doubt if we could get a better man in America to take charge of the laws of this character. So far as I know, there has been very little trouble in instituting this law or in the workings of it. I imagine in the future you will appreciate it much more than in the past.

I have prepared a few remarks here. It is well to get down the subject and if you will excuse me I will read them.

"THE PENNSYLVANIA STALLION LAW."

By Dr. C. J. Marshall, State Veterinarian.

The stallion law has now been in operation for three years, and in that time has been able to demonstrate both its strong and weak points. That much good work has been accomplished can readily be shown, and that amending the law would still better the horse breeding industry is a foregone conclusion.

Primarily the law has been of great educational value. Heretofore in many distances farmers bought stallions without considering whether they were registered or not. As long as the seller made a statement to the effect that a horse was pure bred and registered the buyer was satisfied. Advertisements, such as "An Imported Engilsh Shire Stallion Registered in FRANCE and America" (this fact was actually printed on a stallion poster) demonstrates that the owner evidently did not know what pure bred and registery meant. Now, however, they realize that in order to secure a pure-bred license they must have an authorized pedigree registry certificate, and they have become far more careful.

The requirement of the law, which state that copies of the license certificate shall be posted prominently on the inside and on the door of the stable in which the horse is stood, and that a copy shall be incorporated in all advertisements is a good means of preventing misrepresentation by the stallion owners themselves; because the license certificate differentiates distinctly, in large type, between pure-brd and grade. Thus, a prospective breeder immediately on viewing the license certificate can see whether or not the stallion is of pure breeding and registered, or whether he is a grade.

I do not believe there is any business in which there is more trickery than in horse dealing, and for that reason it is necessary for breeders to use an extra amount of caution. Many men who are otherwise honest do not hesitate to deceive even a friend when a horse deal is being negotiated. Fraudulent pedigrees and pedigrees from unauthorized associations were a very common occurrence but now, knowing that they will not be accepted as a means of securing a pure-bred license they are less frequently found.

The Bulletins issued by the department on horse breeding topics have also been a great help to stallion owners, in fact horsemen in general. However, they have no immediate bearing on the subject of this paper.

The stallion law has encouraged breeders of good horses by giving them protection, and they have in consequence been buying many more pure-bred stallions than heretofore. To show the actual increase let us take the number of pure-bred horses licensed in 1908, which was 666, then in 1909 there were 823 licensed, an increase of 24 per cent; and in 1910 there were 909 licensed, an increase of 10 per cent, while the grade stallions have also been increasing the percentage of the increase has been markedly less. In 1908 there were 1,333 grade licenses issued; in 1909 there were 1,427, an increase of less than 7 per cent, and in 1910, 1,474 grade stallions were licensed, or an increase of only 3½ per cent.

The ratio of increase has been about three pure-bred stallions to every grade. Not only have the pure-bred stallions brought into the State increased in numbers since the enactment of the stallion law, but the horses have been of a better type, especially among the draft stallions.

The present stallion law is good so far as it goes, but under its provisions it cannot go far enough. The owner's affidavit is a bad feature, but it is impossible to demand that each stallion owner have a veterinarian examine his horse, as in some counties they have no qualified veterinarian. The only means of being sure that a stallion is up to standard is to have a commission appointed which shall examine all the stallions in the State, similar to the way it is done in New Jersey. This would be an ideal means of having all horses passed upon in a uniform way. As it is, there is too much difference of opinion as to just what constitutes a stallion of the best type. This inspection would also bring to light all valuless grade stallions, which, although techincally sound, are of such inferior breeding, type an conformation that they are a detriment to the horse breeding industry.

A stallion would not necessarily have to be examined each year he is in the State. This could be modified; perhaps stating that all stallions which had been passed by the commission and had attained the age of say 10 years would be exempt from further inspection.

Then, too, instead of issuing merely three forms of license certificates, namely: pure-bred, grade and cross-bred, it would be better, it seems to me, to have some distinction between pure-bred stallions at least. There should be a class for pure-bred stallions of the highest type, second best, and so on. This would give the mare owner a better idea of the worth of a stallion. As the law now stands any horsethat is properly registered with an authorized association, can secure a pure-bred certificate; this puts a prize-winning stallion in the same class as a horse which (A1, thought by the letter of the law is entitled to the best certificate) is inferior as to type and conformation. These kind of licenses, however, could not be issued unless a personal inspection were made by the authorities in charge of the enforcement of the law. If the commission before mentioned were a fact, of course, it could also take care of classifying the various stallions.

The Pennsylvania law is one of the few exceptions, in not having a lien clause in it. Eight States and one of them is Pennsylvania, have no lien on the colt, or mare and colt, for a stallion service fee. A clause of this kind in the law would not only encourage breeders to buy better stallions, knowing that they would be able to collect the fee agreed upon, but also, would be an excellent means of enforcing the law. If a lien clause were incorporated in the stallion law, stating that only such stallion owners as had complied with all the requirements of the law, could avail themselves of the right to collect fees under that law, it would naturally make all stallion owners very desirous to fulfill all the provisions of the law.

Much criticism is made in regard to the fact that there is no specified list of hereditary unsoundness in the law. This fact, however, was gone over in detail by your committee at the meeting two years ago. Since that time Dr. W. L. Williams, of Cornell, read a paper at the annual meeting of the Pennsylvania State Veterinary Medical Association which confirmed in every sense of the word the report made by your committee on this subject and brought out more forcibly the importance of allowing great leeway in the subject of hereditary or transmissible unsoundness or disease. There appears to be no condition in the list of those usually considered as hereditary unsoundness without illustrious exceptions.

After all the subject of type and conformation appears to predominate most prominently in the subject of transmission, and while we would not recommend prospective buyers to purchase stallions that are afflicted with blindness, ringbones, spavins, navicular diseases, cryptorchidism, roairng, heaves, or sidebones or breed to such during service, the law should deal with them leniently and clients should not be too critical.

The Chairman: Is there any questions to be asked or discussion on the subject before us?

A Member: I would like to ask if there is any objection to breeding to animals after they are 10 years of age?

Dr. Marshall: This gentleman asked me once tonight if there is any reason why we should not breed to a stallion that developed roaring after 10 years old. I don't think there is. I don't want to be understood as recommending you to breed to roaring horses, but there are a great many good horses that develop roaring and I don't believe transmit it. There are a great many cases in which the breeders have investigated the question of transmission of roaring and it was the exception where they could find a case where roaring had been transmitted.

There are good draft horses that in the winter develop asoturia; they are horses of good conformation, good condition and good age, and every cndition favorable, are what we want an dthe best kind of horses. They develop asoturia and they usually die with it, but I don't think that is any argument why we should not breed for that conformation and try to breed for that class of horses. I would say that it is not a dangerous experiment to breed to horses that develop roaring after 10 years of age.

Mr. Moore: Would you recommend cutting out of grade stallions?

Dr. Marshall: I would as fast as we could get pure breeds to take their places. I don't think I would recommend cutting them out at once.

Mr. Norton: The reason I asked that question is that a great many owners of stallions come to the conclusion that in order to protect the pure-bred horses the grade horses should not be allowed to be registered.

Dr. Marshall: I think we should encourage in every way the pure breeds, ans as fast as we can adopt that kind of breeding. I think it better to get rid of grades. I don't see any other way we can get at it.

A Member: Isn't it a fact that we have many grades throughout the Commonwealth that are better than some pure breds?

Dr. Marshall: I think that may be true.

A Member: Why would you advocate a measure that would cripple that feature of the industry?

Dr. Marshall: Well, I don't know that it would cripple it. I think it is a benefit to get work horses from pure-bred sires rather than from grade sires. We would get better horses. I don't see or understand that that recommendation would cripple the trade.

A Member: Well, it would have more or less effect upon it if we go so far as to prevent such a stallion from being registered.

Dr. Marshall: If I was going to breed horses I would want to get the best I could and even than I would want the registered horse if I knew he transmitted his qualities.

A Member: What proportion of light, medium and heavy draft stallions are there in the State?

Dr. Marshall: I don't remember just how those proportions run. There are a great many more heavy draft horses being brought in. There are not so many Thoroughbred or running-bred stallions in the State; and I don't think there are a great many standard bred trotting horses. I think the tendency is more for draft horses than Thoroughbreds.

A Member: How do you prevent asoturia?

Dr. Marshall: I don't know that we can always do that. I think we can sometimes. The best preventive measure that I know of is to cut off the feed when heavy strong horses are standing in the stable and always give them a little exercise. Don't leave them standing in the stable on a holiday and Sunday with the same amount of feed. If you can give them 20 minutes' exercise and cut down their feed one-third or one-half I don't believe there is one case out of a hundred that asoturia will develop.

A Member: Doesn't it develop oftener among the class of horess men are alolwing to stand to get ready for spring trade?

Dr. Marshall: That may be the way in the country, but in the city it is most always horses worked hard every day, then there comes a Sunday with a holiday ahead or back of it, to make two days that the horses stand in and they naturally get the same feedas when out at work, and a great many get paralyzed and usually die. I believe in the country you don't have so much danger of dying. In the country districts they tell me they get well frequently, but in the city we usually have a dead horse when we get one paralyzed in both hind legs. The exercise and cutting down the feed are the best preventive measures.

A Member: Will a horse get enough exercise in a large box stall?

Dr. Marshall: Not enough to prevent asoturia. That will help some.

A Member: Cutting down the feed is it?

Dr. Marshall: Has more to do than the exercise. Cut the feed out entirely and big fleshy horses will be better off if not fed at all when standing in than if fed.

A Member: What would you give a 1200-pound business horse used in the summer, but with not much to do in the winter?

Dr. Marshall: Give him some hay.

The Chairman: Are there any other questions? If not, is Dr. Gilliland present? He does not appear to be.

Mr. Norton: I will make a few announcements and then we will call on someone else.

Tomorrow morning the State Board of Agriculture will meet in the auditorium over at the Board of Trade. The Pennsylvania Livestock Breeders' Association will be at the South Chestnut Street Market. The Pennsylvania Dairy Union will meet in this room. The Horticultural Association will meet in the upstairs hall at the Board of Trade. Thelivestock demonstration will be at the South Chestnut Street Market Hall. Tomorrow all of the livestock meetings will be there in the way of demonstrations of beef cattle, dairy cattle, horses, sheep and hogs; and the steer and hog that are to be used in the meat demonstration Thursday afternoon will be killed tomorrow afternoon, and the demonstration of the cut carcusses will be here in this room on Thursday afternoon.

The Chairman: Are there any other announcements to be made? If not, I see a gentleman in the rear of the hall I know you will all be pleased to hear from, and that is Professor Agee, of State College.

Professor Agee: I appreciate this invitation. You have a full program this evening and I am sure that you do not want to hear from me at any length. I am glad that associations, representing special interests in Pennsylvania agriculture, have finally arranged to hold their meetings during the same week of the year and at the same point in the State, so that all of us may get into touch with each other. This is the way Ohio has done for a long time, and great good has resulted.

I am sorry that I did not hear my friend Zinn discuss the subject of permanent pastures before you this evening. I should not say anything about making sods as I did not hear Mr. Zinn, but you will allow me to emphasize the truth that good, heavy sods are the stepping stones to agricultural prosperity in our State. We can make such sods, and I know that he told you how he is doing so on his own home farm. Pennsylvania is adapted to grass and when we fertilize the hills of this State we can have sods. Our farmers continue to ask about fertilizer for corn. When this land is thin and must be planted with corn, of course fertilizers should be applied; but the right place for commercial fertilizers is the land seeded to grass. We can seed grass so liberally that the sod will make a big corn crop, and we can do this with double profit. When land is seeded down it should have liberal fertilization, and if the sod is left more than one year for mowing it should receive a heavy application of fertilizer early each spring. We have tested this out on thin land at State College, and it is one of the best object lessons our Experiment Station now presents to the farmers of the State.

I presume that Mr. Zinn advocated the use of lime on all soils that are acid. In Pennsylvania, three-fourths of the farming land has a deficiency in lime. If we do not meet the lime requirements, the grass and clover plants are not properly fed, and we do not get the sod that gives pasture and hay; and we do not get the organic matter for the corn crop that follows:

I hope that you expect me to say something of our School of Agriculture at State College, as I cannot afford to stand before Pennsylvania farmers and not mention this work which seems so important to me. We have 625 students in agriculture at the College now, and next year we will have 800. Many of these men are going back to Pennsylvania farms. Two hundred and twenty-five of them are taking courses that lead only to practical farming, and a considerable percentage of the remainder are planning to own farms and live upon them just as soon as they are able.

A Member: What are you doing for the girls?

Professor Agee: We have a Domestic Science School that can train a girl so that she will be as good a homekeeper as her mother is. She can do her work better because she will know more about the sanitary laws and more about chemistry. Why should our Pennsylvania farmers send their daughters to schools that do not prepare them for the practical work of life? They have a right to a knowledge of the science relating to homekeeping just as well as the boys have aright to the science that relates to agriculture. We now have only 30 girls in our Domestic Science School.

A Member: You ought to have 625 to keep up with the boys.

Professor Agee: Well, you must count upon one or two of the fellows not being the right kind of material for husbands, so we will say that 623 girls would be about right. They should be in the school and we should send them there. The girls have a right to vocational training. It is not square to them to give only such training that they must go into the school room year after year, instead of being fitted for the world's work so that fellows on small salaries can afford to marry. When our young men come to my office to talk about the work that they should engage in, I say to them: 'You should look ahead to the time when you will make a home. That is what you are working for, no matter whether you realize it or not. It will only be a few years until the best thing in your life will be a home of your own, and you should plan your life work with this end in view. If a girl has not been trained to work with her hands and believe that home-making is wholesome work, the question of the college man making a home cannot be solved.

I would not have you think that I am pleading for the Pennsylvania State College. I am interested only in the young people who shall have the training that will make them worth while in this world, and State College is the opportunity because it furnishes vocational training. If it did not do so, it would not deserve any special consideration.

The Chairman: Now, we would like to hear from that one exception, that one young man that is not worthy of a home of his own, Professor Van Norman.

Professor Van Norman: If this thing keeps on I will have to do something in self-defense. Why I should be singled out I don't know. I guess my condition is different from the others. Most of you grew up in some one place and spent so much time with some one girl that she got you to think that you owned the girl and you got married. On the other hand, I have been on the run all the time and never seen the same girl twice. I don't know why it is that my job has kept me on the move. Between you and me—and I would not tell this to the dean—the facts of the case are that I have not been at the college two months in succession in one and one-half years. I was here today and day before yesterday down in Chester county; four days before that I was in Chicago trying to start up a dairy show and week before that in New York trying to help the airship fellows. I don't see how a man can get married under those conditions. I think the wife would have a sorry job if he was married.

Getting to something of a more serious nature, it is gratifying to us who have been struggling with educational problems to see the interest and enthusiasm being awakened in our lines. When I left Indiana and came here five years ago there were 14 students in the four-year course and 52 students in the winter course, making 66 students that first winter. Some of my western friends called me a fool for coming to Pennsylvania. I told them that the clouds were gathering, the storm was due; it was going to come no matter who came here. The storm was coming; the boys followed the storm into the college and they are coming still.

I believe, looking at the opportunities in agriculture today, that they are big because it takes a bigger man today to be a successful farmer in the next 10 or 15 years than you men have been in the last 15 years, and the boy who goes into the next 15 years' of work with no better training than you, he is not going to get up as you have, because the conditions have changed and the man who meets those conditions must be better equipped. He must have a better knowledge of the fundamentals and principles of science that underlie the whole thing and must have a better understanding of what they call business principles. I am going to have a crack on the other side of it. This great country of ours in keeping developed has been made possible because of two or three things: One of them is organization and another is knowledge of the cost of production—bookkeeping, in other words; and I believe our successful farmers of the future must know more of how to keep account of what they are doing. I have had men come to my office and say a certain line of work was not paying, but they could not give the figures for it so that the man might be sure of what he was doing. It takes a good deal of figuring and head work and wise skill to balance these things up. I believe the opportunities before the young men of our State today are immense.

There is another side to this that has not been brought out. We have in this great State thousands of men who in the years gone by left home and went into the city to study law and medicine and manufacturing and business, and now the good father and mother they left there on the farm have gone on and they have got the farm and the farm is up here in the country, and they are writing to us up at the College to send a man to come down to the farm and bring that farm up and to keep it up, and we have not got the men. Ther are 42 men in the class today and only four looking for a job. I want one but Ihave seven men that want the other three, and yet there are thousands of boys in this State of Pennsylvania that could equip themselves to take charge of these farms and get the experience at the other fellow's expense. That is why I stick to the College—all the mistakes I make the State pays for. If I ever get enough money saved up to buy a farm I will get this experience at the expense of the State. And the fellow that runs the other fellow's farm is going to get a lot of experience more or less at the other fellow's expense. There are thousands of boys competent to carry on these farms and render good service if to practical experience they will add training that they can get at our college or some other. You must know that boys working out at $15 to $25 a month and many of them at $10 a month, if they would equip themselves to meet these places you could not tie them home to work with you; and that is just the ideal situation. I tell you the ideals are big. I think you will hear enough of me before the week is through. (Applause.)

The Chairman: We would like to hear now from Dr. Marshall, our newly appointed veterinarian.

Dr. Marshall: I hardly know what to say. I have undertaken a work I know you are all interested in, and I want to serve you the best I can. It will be my aim to carry the work on as it has been organized and do the work to the best of my ability. In any way I can assist any of you in doing this, just call on me and see what I can do. I will try to do my best.

I presume you all knew Dr. Pearson and knew a lot about the way the work was organized, and you helped him organize it. I know this Breeders' Association is one of the biggest backers that the State Livestock Sanitary Board has ever had, and many of the members have assisted the State Livestock Sanitary Board in ever way; and if I have to call on you for assistance in the future I hope you will be as prompt to respond as you did with my predecessor.

I do not know that I can say anything more. I will just repeat, that if there is any way I can help you just let me know. (Applause.)

The Chairman: Now, gentlemen, I hope you will all take advantage of the show or displays that are upstairs. I know they are worth looking at and examining and studying; and all bear in mind the meetings that will be in session tomorrow morning.

With that, you are excused for the evening.

Whereupon, adjourned at 9:15 o'clock p. m.

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Young, A. P., Millville
Yost, H. Y., Reading
Zook, John F., Belleville

Cups awarded to exhibitors of creamery butter, dairy butter, market milk, market cream and certified milk at the Thirteenth Annual Meeting of the Pennsylvania Dairy Union, Harrisburg, Pa., January 24-27, 1911.

PROCEEDINGS OF THE

THIRTEENTH ANNUAL MEETING

OF THE

PENNSYLVANIA DAIRY UNION

In Joint Meeting with the

PENNSYLVANIA LIVESTOCK BREEDERS' ASSOCIATION

AND THE

PENNSYLVANIA STATE BOARD OF AGRICULTURE

HARRISBURG, PA.

January 24-27, 1911

H. E. VAN NORMAN, SECRETARY
Edited by A. A. BORLAND, Assistant

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Edken, Robert B	Westtown
Haines, W. H	West Grove
Harris, D. J	Corner Market and Water Streets, Philadelphia
Harris, D. J., Mrs	Corner Market and Water Streets. Philadelphia
Hayes, C. E	51 Greenwood Avenue, Trenton, N. J.
Henson, L. B	Coatsville
Jones, Wm. H	Upper Darby
Jones, E. E	Harford
Keim, Wm. P	Pottstown
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Sharpless, Joseph	London Grove
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Stokes, H. M	Hanover
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Swartz, L. H	Springford
Titus, Frank B	199 West Owen Avenue, Lansdowne
Townsand, Prat.	Harford
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Williamson, E. C	Morrisville
Woolman, Edward N	4709 Lancaster Avenue, Philadelphia
Woolman, Henry N	4709 Lancaster Avenue, Philadelphia

MEMBERSHIP LIST 1911.

The following persons have paid 1911 membership fee, or have contributed a tub of butter to the exhibit:

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Blish, Otis	McCalls Ferry
Borland, Andrew A	State College
Brandywine, Dairies	Brandywine Summit
Brinton, J. H	Gap
Bringhurst, Joseph	West Chester
Brown, G. B	Pineville
Burkhart, J. N	Newville
Chamberlin, John	Parkesburg
Colonial Salt Co	Buffalo, N. Y.
Comfort, H. W	Fallsington
Critchfield, N. B	Harrisburg
Crowell, Preston	824 Sixth Street, Harrisburg
Dewey, H. W	Sydney Center
Dodge, J. E	Narbepth
Donahue, G. G	1907 Market Street, Philadelphia
Echoff, W. M	R. F. D. No. 2, Coatsville
Engle, S. G	Marietta
Erdman, A. H	Wiconisco
Erk, George	Seeleyville
Fletcher, A. W	Bedford
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Gabler, B. F	Greensboro
Garbet, E. L	Lititz
Garret, Chas. J	West Chester
Gandrum, D. H	Muncy
Gaul, J. W	Miffintown
Guernsey Creamery Co	Guernsey
Hagerman, W. H	Milner
Hagerman, D. C	Milner
Hammill, Robert	Cochranville
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Harris, D. J., Mrs	Corner Market and Water Streets, Philadelphia
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Jones, E. E	Harford
Johnstown, Ezra C	Box 305, Alelgheny
Kellog, Dr. Thos	1204 Pine Street, Philadelphia
Kendig, John R	Pomeroy
Knight, H. H	New Bethlehem
Knoll, F. P	State College
Lane, C. B	Philadelphia
Larson, C. W	State College
Leonard, Austin & Son	Troy
Lower, Mrs. Elmer E	Mechanicsburg
Marshall, W. D	Lyndell
Martin, A. L	Harrisburg
Maule, Edwin	West Grove
Maurer, T. H	New Berlin
Maxwell, E. B	Quarryville
Mott, O. D	Edinburg
Morse, S. E. & Son	New Milford
McClure, W. W	R. F. D., Downingtown
McCoy, R. H	524 Forest Avenue, Avalon
McGranahan, W. H	Kennard
Norton, W. C	Waymart
Ott, Harry E	Wismer
Paxton, George G	Huston
Pencoyd Farm	Bala
Phillips, M. T	Pomeroy
Reichert, J. H	Scranton
Richardson, C. M	Burnville
Sellew, R. P	Mercersburg
Shoemaker, M. P	Greensburg
Sharili, S. A	Mercersburg
Sharples Separator Co	West Chester
Shrum, W. F	Jeannette
Smith, Horace T. & Son	Buckmanville
Snavely, H. H	Willow Street, Philadelphia
Spanniel, H. A	Kempton
Stokes, H. M	Hanover
Stuntz, E. H	Harrisburg
Stivel, H. H	Kumry
Supplees Alderny Dairy	Philadelphia
Titus, F. B	Lansdowne
Twining, F. M	Wycombe
Van Dyke, C. P	Knoxville
Van Norman, H. E	State College
Weld, R. J	Sugar Grove
White Horse Farm	Paoli
Willow Brook Dairy	Willow Grove
Winney, A. U	Thompsontown
Yost, A. H. A	New Ringgold
Yost, S. T	Myerstown
Zug, Ephriam	Prescott Station

CONSTITUTION OF THE PENNSYLVANIA DAIRY UNION

Article 1.

The name of this organization shall be The Pennsylvania Dairy Union.

Article 2.

It shall be the object of this organization to promote, protect, encourage, and develop the dairy interest of the Commonwealth by every means within its power.

Article 3.

Any person, firm or agricultural organization interested in dairying may become an active member for the calendar year on payment of one dollar ($1.00), or may become a member for life on payment of ten dollars ($10.00).

Associate Members: Any agricultural organization that is an active member of the Pennsylvania Dairy Union may have its members listed as Associate members for the calendar year on payment of twenty-five cents ($.25) for each such member. Associate members shall not hold office or vote.

Any one rendering this organization noteworthy service, may by a unanimous vote at any regular meeting, be chosen an honorary member.

Honorary members need pay no dues, they may participate in business, but not vote nor hold office.

Article 4.

The officers of this organization shall consist of a president, one vice president, a secretary, a treasurer, and six directors, all of whom shall be elected by ballot at the annual meeting, and shall hold office for one year. The president, secretary and treasurer, together with the directors elected, shall constitute a board of directors.

Article 5.

1. The president, vice president, secretary and treasurer shall perform the duties ordinarily appertaining to those offices.
2. Between the meetings of the Union, the board of directors shall have the general management and control of the property and affairs of the organization, subject to the Constitution and By-Laws.
3. Four members of the board of directors shall constitute a quorum to do business.
4. The board of directors shall organize by the choice of a chairman, and a secretary, and may adopt such rules and regulations as shall seem desirable for its government and may appoint such committees from its own members or from the general membership of the Union as it shall consider desirable.
5. It shall be its further duty to decide the location and date of the annual meeting of the organization, and to make all necessary arrangements therefor.
6. No expenditure of the funds of the organization shall be made except by a majority vote at a meeting of the Union, or as authorized by the board of directors, and all bills shall be approved by the chairman of said board, before their payment by the treasurer.
7. The board of directors shall serve at each meeting as a committee on resolutions.

Article 6.

Meetings shall be called by the president at such time and place as may be designated by the board of directors. There shall be at least one meeting of the Union each year.

Article 7.

At any regularly called meeting, fifteen members shall constitute a quorum for the transaction of business, but a smaller number, not less than eight, shall have the power to adjourn to another date.

Article 8.

This constitution may be amended at any annual meeting by a two-thirds vote of active members present, provided notice of such amendment shall have been given in the call for the meeting, issued at least a month previous thereto.

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*As amended Jan. 16, 1908.

Joint Meeting of the Pennsylvania Dairy Union
and
Pennsylvania Live Stock Breeders' Association

Proceedings of the Dairy Union

Harrisburg, Pa., Jan. 25, 1911.

ADDRESS OF PRESIDENT.

H. M. Stokes, Hanover, Pa.

The President—Ladies and Gentlemen: We are about to open the Thirteenth Annual Meeting of the Pennsylvania State Dairy Union. I would say to you that it is with a great degree of pleasure that I represent you in this, the thirteenth meeting. It has been my pleasure to be identified with the Pennsylvania Dairy Union for quite a number of years, and I full well remember that up to about five or six years ago, the Pennsylvania Dairy Union was carried on in quite a half-hearted manner. At that particular time, however, there was injected into our meetings a spirit that commenced to stir up a great deal of interest. This spirit was Prof. Van Norman, who has been very active and has added much to the interest of the dairy meetings. I remember full well about five or six years ago when he was called to the dairy meeting which commenced on Wednesday at 10 o'clock. We met in the Board of Trade Building. The rooms were cold; few were there; and, of course, the meetings themselves were not at all enthusiastic. But the following year a splendid meeting was held at Wilkes Barre, and I am pleased to say that from that time to the present we have had very enthusiastic meetings, meetings that have done the dairy men of this country a great measure of good and have been a stimulus to the dairy industry.

I wish to state to you that we want every one to help; we want everybody to be enthused; we want everybody to give his opinion. We want a general experience meeting, for by those things we learn and that is what we all wish to do. We want everyone to feel perfectly at home, and to feel perfectly at liberty to help in every way, shape and form. If you haven't a set speech and have only an idea to put forth, it is the idea we wish you to express and by so doing I know you will start a discussion from which we will all learn. Now, I want you to feel that each and every one is a member of this meeting and has a part to perform. Often times the very best and fundamental truths are given in the simplest language and we hope that every one will feel perfectly free to ask questions and to give his ideas. By doing so we will make this one of the most enthusiastic meetings we have ever held, and we will all go away from here greatly benefited. Each and every one's experience helps the other. It matters not what that experience may have been, and whether it is great or small. The important point is to help each other by giving that experience. Do you know that I oftimes think the longer we are in the dairy business the less we know, and I find by studying, by investigating and by getting other's opinions that sometimes the views I have always held are entirely wrong. There are not a great many of us here this morning, but I know that by each and every one trying to help, we can have a very enthusiastic meeting for the next two hours.

PREPARATION OF CREAM FOR CHURNING.

W. H. McGranahan, Pittsburgh, Pa.

Ladies and Gentlemen: I realize this is an important subject. I wish that I could do it justice and do you justice by giving you something new, something good, or something instructive to take home with you, but I fear that I cannot give you a great deal this morning. However, I will try to give you a few observations that I have made in my own dairy work. No doubt some of you will not agree with all the things I have to say this morning, but that is only natural. I think it is the exchange of ideas that will do us the most good. The good general debate which follows a subject of this kind really brings out the most truths and does the most good and makes us better dairymen and butter makers. So I will briefly give you a few of my ideas and thus get the subject started:

Preparing cream for the churn is, in my opinion, the most important part of creamery work. In no other part has the butter maker such a chance to get in his good work and to show his skill as at the ripening vat. My experience with that part of the labor is that you can teach a beginner to churn, to do the mechanical part, so that he can get a churning through that may score perfect body, salt and style and yet perhaps he has not commenced to comprehend the business of the ripening vat. Flavor is not made in the churn, but in the ripening vat. That is not just quite the idea I wish to convey, perhaps I should have said that the finishing touches to the flavor are put on in the ripening vat. Let me add right here that it is these finishing touches to the flavor that gets us up in the special class, and gets the extra two or three cents or whatever the increased price may be. At the present time the market demand for sweet butter, or butter churned from sweet or unripened cream, is so small we will not speak of it this morning, but confine the talk principally to ripened or sour cream.

There are two reasons why cream is ripened: First, and most important, to secure the flavor and aroma which are so characteristic of high scoring butter. The flavor and aroma are produced by the good ferments which are present in the cream during the ripening. Bacterologists and scientific investigators differ as to the specific group of ferments that produce these flavors.

The second reason for ripening is to increase the churnability of cream. We know that the buttermilk from cream ripened under ordinary conditions and churned at a medium low temperature should contain not more than one-tenth of one per cent. butterfat. However, the buttermilk from sweet cream under similar conditions will show up four times as much butterfat. A little saving in fat each day amounts to considerable in the course of a year.

The first step in the preparation of cream and the most important one is to secure good material. This is the hardest part. If we could only have milk and cream delivered at the creamery, sweet and clean, most of our troubles would be over right away, but unfortunately this is not the case. When once milk and cream has become off flavor and tainted, no butter maker, however skillful he may be, could make a gilt-edged product from it. It is just like a man trying to build a house out of bad lumber, rotten shaky stuff. He may be a good carpenter and do his work well, but when it is finished he has only a second-grade building. It is the same way with a butter maker trying to make fine stuff from tainted cream; he will have only an under-grade.

It is an advantage to get heavy cream. If milk is being taken in, adjust the separator to skim a heavy cream, say 35 per cent, or even higher, and if hand-separator cream is taken in, try to induce patrons to deliver as heavy a cream as possible. This will enable the butter maker to use a large amount of starter without making the cream so thin as to cause hanging in the churn. It will also save time, power, labor and ice on account of the less bulk. The butter maker will have less work and trouble to get cream churned, and again he will have a small saving of fat in the buttermilk, not because heavy cream churns out cleaner than thin cream, but on account of there being less of it.

A clean sanitary building, clean surroundings and a pure atmosphere are necessary for the proper care of cream. How often do we see old dilapidated creamery buildings with old tin vats, rotten wooden floors and little or no sewage. I am not much acquainted with conditions in the eastern part of Pennsylvania, but I know that in the west we have a good many such buildings. They were built years ago through the interest of creamery promoters, and were set up on posts a good deal like a corn crib. Those same creameries are in use today. That is probably a little off the subject, but I wanted to emphasize this point of a pure atmosphere that will not contaminate the cream. We should use well-made vats and utensils. I like to have the conductors open, if possible, so that we can clean them better, otherwise use sanitary pipes. I do not like to use these old iron pipes at all, and when putting up sanitary pipes I believe you want to use plenty of unions. I think a union every six feet is none too many, so that we can clean the pipe thoroughly. This pipe should be taken down every day, thoroughly cleaned and steamed and left down until needed the next day.

I believe in pasteurization, but when milk and cream are cared for in a proper manner there will be no need for pasteurization. I think where ripe ferments are handled the cream produces a good flavored butter, but cream as delivered to the Pennsylvania creameries today should be pasteurized. We should learn to think of the fat of cream not as a dead mass, but as the home of countless millions of organisms which may be our friends or may be our foes. If the butter maker goes ahead and ripens up cream in its natural state and the good ferments happen to predominate in that cream he will probably secure a good flavored butter; but if the undesirable organisms are in the ascendency on that day he will get an off flavor. This makes an ununiform grade of butter. We all know how butter buyers kick on butter that does not run even. I therefore hold that the best plan is to destroy these organisms by thorough pasteurization, and then to add a starter which we know contains the germs which we want. This will secure a uniform flavor in the butter from day to day, a matter which is of great importance. If we pasteurize our cream somebody may ask what will be the pasteurizing temperature? This seems to be a debatable question. Different men use different temperatures, all the way from 140 to 200, and back up their claims by the good scores they made by pasteurizing at a certain temperature. We are thus really at a loss to know what is best. My own preference is for a high temperature, at least 175 to 180. I like to compare the pasteurizing of cream with a farmer getting a field ready for sowing. A careful farmer will thoroughly harrow and cultivate his field and destroy all the weeds in sight. So will the careful butter maker pasteurize his cream. I believe that poor pasteurization is worse than no pasteurization. A temperature down to 125 one minute and then up to 200 the next will not give good results. I think such methods are like those of a careless farmer. He is harrowing to get over the ground and is driving a little wide and leaving strips of weeds here and there. I think low pasteurization leads more or less to undesirable organisms.

I prefer a pasteurizer that pasteurizes rapidly and a cooler that cools quickly. This I have found necessary to give body to the butter. This last summer we have used the new style ripener altogether, and experimented a good deal in trying to pasteurize the cream in the ripener, but we met with little or no success because the butter in nearly every instance was away off in body. It would not stand up. Understand me, I am not knocking the new ways; they are all right; I like them. I would not like to go back to the old vat to ripen cream, but I do say there are better ways of ripening cream for the churn than the new ripeners. After the cream has been pasteurized it should be cooled to 68 to 70 degrees. I think the ripening temperature is important. We have tried all temperatures from 58 to 75, but a temperature of about 68 to 70 seems to give us the best result. So I say, after the cream has been brought to 70 degrees, at least 15 per cent of good starter should be added. The starter should just be coagulated and contain about seven-tenths to eight-tenths per cent acid. I find it always well to mix the starter thoroughly by pouring it from one bucket to another before adding the cream; this will break up the starter and mix it with the cream. Then in about three hours, if the starter has been a vigorous one, you will find the cream to contain about four-tenths of one per cent of acid. If I am going to churn the next morning I now cool the cream down to 48 or lower. You cannot expect the development of acid abruptly. I have found by testing hundreds and hundreds of vats at cooling time and again the next morning that when you retain about four-tenths of one per cent of acid you will have five-tenths the next morning.

I would like to emphasize this point of not getting too much acid in the cream. I believe too much cream is over ripened. Butter churned from over-ripened cream seems to go off flavor sooner and get rancid. I have been told lately that the government, which was at work on the fish flavor in butter attributed it to this cause, over-ripened cream. I have long ago quit guessing how sour the cream was. I am using an acid test right along; they are simple, cheap and easy to operate. We have a number of good ones on the market. At home I use the Van Norman test. I have it on the shelf handy to the cream vat, and make a test in a very short time, less than a minute, and this stops all guess work.

I would like to add a word about cooling cream. If I were trying to cool cream in an open vat with ice and water around the jug, a process which we all know is slow, I would not hesitate to put a small amount of good artificial ice in the cream to prevent the acids getting ahead of me. Of course, this practice is to be condemned. It is only in the case of an emergency and we all know pond or river ice should never be put into cream under any consideration.

Now, I have not gone into the details of starter making. That would take too long, it is a whole topic in itself. Just a suggestion to beginners: Any one expecting to make a starter should secure the booklet issued by the manufacturer of the culture which you have decided to use, and study it well. Do not read it over once, but study it and get it almost by heart. It goes into the details thoroughly, better than I can tell you. Follow those instructions faithfully and good results are assured.

I would like to sum up the topic in just a few words: You must have good material; fight for it, if necessary. If you will pasteurize the cream and ripen it with a good starter in a clean sanitary building, a deliciously flavored butter will surely result.

I thank you.

The President: Members of the Dairy Union, this is a very important subject, and I would like very much to hear some discussion on the manner of ripening cream. I think it is one that interests us more than most other subjects. Now, I would like to hear someone else give their experience in this matter of ripening cream. In the matter of pasteurization of cream, I believe that the government is making experiments. We have some men here today and I am going to do some drafting if there are no volunteers. I am going to draft a gentleman who has had a great deal to do with the selection of butter for the United States Government. I am referring to Professor Larson, of State College. Professor Larson, what have you to tell us on that subject?

Professor Larson: I can only second the remarks of Mr. McGranahan. I think he has given you a very good description of it. It is unfortunate that we have to consider the bad cream. If we had all good cream it would be all right, any of us could make good butter. But we do have bad cream and the best butter maker nowadays seems to be the man who can make the best butter out of bad stuff. When we have bad, sour, over-ripe cream, we must pasteurize it and then we must get it on the market as soon as possible, and we must churn it as soon as possible after it gets into the creamery. I think one of the greatest mistakes of Pennsylvania butter makers is that they hold cream too long. They get it in bad shape and then make it worse. I believe if they would pasteurize it at once and make it into butter at once, they would improve the quality of their butter materially.

As to the pasteurizing temperature: I think Mr. Granahan gave you about the right course. I think it should be at about 175, but when you have sour cream sometimes you have difficulty in pasteurizing it. This can be slightly overcome by insisting that the patrons bring thicker cream. At least thick cream will keep better than the thin cream and besides that it will be easier to pasteurize. The thick cream, if it is sour, is very difficult to pasteurize.

That, I believe, is all I have to say, unless there is some question.

The President: Do you think it is better to hold it after it has been pasteurized? Do you have any experience along that line?

Professor Larson: The President asks about quick pasteurization and holding. I have no definite information as to that. I do know that at the contest in Chicago, the judges criticized a great deal of butter for having an undesirable flavor that they claimed was due to holding pasteurization, that is, by pasteurizing in the ripener. They claimed that this undesirable flavor was not found in butter pasteurized with the ordinary continuous pasteurizer. If you heat the cream high enough, 175, I believe continuous pasteurization will give good results.

The President: Anything further to be said on this interesting subject? I really think that the Pennsylvania dairymen or Pennsylvania butter makers have more to contend with in this matter of getting the cream in an improper condition and then trying to make a good grade of butter out of it than with any other single thing. I do not believe that you can make a good grade of butter out of cream that is not ripe. There may be a possibility of improving it some. I would like to hear someone else enlarge on this matter. Is there anything further to be said? If not we will go to the next topic.

LEAKS THE CREAMERY MAN CAN PREVENT.

B. D. White, Dairy Division, Washington, D. C.

Mr. Chairman, Ladies and Gentlemen: I can assure you that it is a pleasure for me to be with you today. I say this for two reasons: First, because I promised to come to your meetings for the past two years and failed to appear, and, second, because it affords me pleasure to meet the creamery men of the State of Pennsylvania. Now, with your permission, Mr. Chairman, I would like to reverse the two topics upon which I am to speak. You will notice I am on the program this forenoon and this afternoon, and if you will permit it I would prefer to discuss the "Creamery Leaks" this morning and "Market Conditions" this afternoon, unless there is some reason why I should not do so.

The President: You may choose either topic.

Mr. White: I will try to make myself heard, although I do not believe that I shall be able to be heard distinctly on account of the feet shuffling on the floor above, but if you do not hear me, just speak out. I believe it will be a good idea to have you come in a little closer, not only for myself but for the speaker who follows. There are some chairs in front here.

The President: I would be very much pleased if those who are in the rear would come closer and take the seats in the row up front.

Mr. White: I want to say further that I am not here for the purpose of delivering an address. All I hope to do is to get up a discussion. There is more good comes from a discussion than from the long talks or long papers. Therefore, I am going to touch on a few points that will interest you and hope that you will start a discussion. I also wish to say that I want you to feel at liberty to stop me at any time and ask questions. Because if you should wait perhaps it will slip your mind or you will not think it right to ask it afterwards.

The subject, therefore, this morning, will be "Creamery Leaks." If we go back a few years and consider the development of the creamery industry of the United States, we can readily appreciate why some creameries are operated in such a slip-shod and hap-hazard manner. Now, that is pretty plain talk, isn't it? I believe that the losses sustained by a large number of creameries are due largely to the fact that creamery men have not had an opportunity to associate with their neighbors and talk over matters of importance and solve some of these questions. The leaks in some creameries are so large that the entire creamery leaks away, so to speak. The creamery, of course, does not disappear, but the money that may be in the business disappears, and sometimes it is necessary to close the creamery on account of such leaks. I say sometimes. I have seen many creameries fail because of the leaks. I want to say further that I believe that nine-tenths of the creameries that have been closed were closed because of mismanagement, which is no more than a leak.

I have made a few notes to aid me, and in order to make this as short as possible I will try to get right down to business. It does not make any difference what leak we take first. There are so many of them that when we get through we will have a whole lot of them and some pretty large ones. We will start first at the weighing can, assuming that you are receiving the milk and the cream at the creamery. Often we find there a very serious leak on account of the old, worn, rusty and inaccurate scale. I can tell you a little experience along this line. When I was making butter we tried to keep a record of the overrun. We knew what it ought to be, but finally the overrun dropped. There apparently was no cause for such a drop. We examined everything but the right cause, and that was the scales. We were using a five-beam scale and finally found that on the bottom of one of the weights numerous holes had been bored at the factory, and some of them were filled with lead. The holes were bored for the purpose of balancing the weights, or getting them the right weight. Sometimes they were bored too deeply and had to be filled up again with lead. One of those lead fillings dropped out and made a difference of three or four pounds on each weight, and you can realize what the result was. Now, the way to overcome this is to have at your creamery a fifty-pound weight, which is supplied by the manufacturer and which you can use to adjust your scales. This is commonly called a test weight.

Now, that was one leak, and there is always a possibility of such trouble. The next leak, I believe, is in the taking of the samples. Different methods are followed. I believe the one usually followed throughout the country is to dip out from the weighing can a sample for composite test. This perhaps is about as accurate a way of taking the sample as I know of, but the sample should be taken immediately after the milk is poured into the weighing can. We have had difficulty where the buttermaker weighed the milk, set the figures down on the milk sheet and then took the sample for the composite test. During the very short time the cream had commenced to rise to the surface and the buttermaker skimmed off a heavier or a larger proportion of cream than he ought. That is also one of the leaks.

Now, if you have haulers—are there any cream haulers in the State of Pennsylvania, Professor?

Professor Larson: Oh, yes, lots of them.

Mr. White: If there are not I was going to omit that, but if there are, I am going to discuss that for a moment. I believe that there is considerable loss sustained to creamery men where they have creamery haulers. I also believe there are very few creameries operated at the present time where the haulers are properly checked up. In our work we have found creameries losing several thousand dollars per year on account of the haulers not taking accurate samples or on account of their dishonesty. We have found instances where a hauler had a good many relatives on his routes. The patrons were all very well satisfied with the hauler and they had good reasons for being so. When we checked up we found that he had given them better weight than they were entitled to, and that he was also taking a sample of the cream immediately upon his arrival at the farm without stirring the cream. The sample was taken from the top. Now, this can be obviated by checking every single hauler. How? I assume, of course, that the creamery haulers in Pennsylvania are given jars in which to fill the sample, and the haulers also weigh the cream. When the hauler arrives at the creamery the cream should all be weighed and a composite sample taken from such cream and tested. This, of course, will give you the total pounds of butter fat and the total pounds of the cream; then you test each individual sample the day it arrives. Now, do you all do that, or do you make a composite of the samples as they are delivered by the cream haulers? If you do, I believe you are following the wrong method. I believe it is absolutely necessary to test every sample of cream each and every day. Therefore, if you do test it every day you must compare the pounds of butter fat you have to pay for with the pounds of butter fat that the hauler has delivered, and if there is a shortage, of course, you know where it is. Now, if you receive cream I would like to ask what is the practice of receiving and weighing such cream at the creamery? Will some one tell me. We can make a good deal better headway if someone will explain whether the cream is poured into a weigh can or whether the individual can is weighed, or what is done.

Mr. ———: With us it is weighed right in the milk can.

Mr. White: In the same can in which the milk is weighed?

Mr. ———: No; in the same can the cream comes in.

Mr. White: I see, in the individual can. I believe that is preferable in all cases unless the hauler is provided with cream-carrying cans. Those, of course, may be emptied into a receiving can at the creamery. However, this should only be done after the milk is weighed and the can thoroughly rinsed out. Now, if the individual farmers bring in or send in the cream in their own cans it would not be advisable to pour the cream into the weigh can for the purpose of weighing. It would be best to put the can and all upon the scales and weigh it and subtract the weight of the can and give the man credit for what cream he has.

Mr. ———: Why is that?

Mr. White: Because if you were to pour the cream from the individual farmer's can into the weigh can, it would first necessitate rinsing the can for the purpose of getting all the cream out, and you would also have to rinse the weigh can. For instance, if a farmer drove up to your creamery with cream that tests fifty per cent, a considerable portion of it would adhere to the weigh can unless it were rinsed out, a method which requires too much work, and perhaps dilutes the cream with water too much. Now, if the practice of weighing the cream in the weigh can is followed, the next man who drives up may be having cream testing only twenty per cent. That would be poured into the weigh can and would rinse out the amount left in and the second farmer would get the benefit at the expense of the creamery. I would not advise using the ordinary scales for weighing the cream in the individual farmers' cans. I would provide a more sensitive and more delicate scale for that purpose. Too often we find where the cream is weighed on a large scale there are errors, and very often the loss is at the expense of the creamery man.

Now, in reference to keeping the samples: I do not believe it will be necessary for me to touch upon that a great deal, but we have found much difficulty in the creamery men getting accurate samples from the composite test. We have found in some cases where milk is kept for one month, or even for two weeks, that the covers were not tight on the jars, and the result was a considerable evaporation of the moisture in the milk. This would make the reading of the butter fat higher than it ought to be, or in other words the creamery men would pay for more butter fat than they received. I remember one instance in particular where the butter maker did not receive any overrun at all and wrote for assistance. We went to help him out and found that he had his test jars placed in a rack above a steam radiator. The weight of the bottles on the shelf pressed it down to such an extent that he could not get the bottles in with the covers on. The result was, the covers were left off and of course you can realize the evaporation that took place in those samples. He lost at least twenty per cent.

Now, we will proceed one step farther, and we will go to the taking of the samples for testing. We found a great deal of trouble in some States to secure accurate pipette for testing. You have a law here on that subject. If you do not, how do you know that you are getting from the manufacturers an accurate pipette? You don't know, do you?

Mr. ———: No, we are apt to get poor glasses because the other States have the laws.

Mr. White: Absolutely true. In other states there are laws compelling the use of accurate glassware and they receive the best and the poor is passed on to the states where there are no laws. Therefore that is a point for you to consider and correct.

Now the test bottles; they are another source of leak. Not so much with milk bottles as those intended for cream. We find that the milk bottles are fairly accurate. The cream bottles are very, very inaccurate, as a general rule. Now why is this? In the first place, there are so many different kinds of bottles made that no creamery man or no agricultural school can require the glass manufacturers to send bottles that will conform to any specification. Isn't that true? There are no specifications at the present time for cream bottles. Neither are there for milk. Now I want to say here that this ought to be corected as quickly as possible and an effort be made—and by the way Prof. Larson and Prof. Van Norman you can do a great deal to help this mater along. I have said an effort is being made to prescribe a certain specification for milk and cream bottles. This will be done in co-operation with the dairy instructions and the bureau of standards.

Prof. Larson: We have sent our recommendation and specifications.

Mr. White: You can go farther than that. Get after the committee and get an action from them. Get them to meet. They have been a little slow along that line, because this is a matter which is so important to the creamery men. You can never tell what kind of a bottle you will get from the manufacturers and yet it is possible for them to make bottles that are absolutely accurate. I would advise discarding all the six-inch fifty per cent bottles immediately. The best way to get rid of them I believe is the way a certain man advised at a meeting sometime ago. He said to take all the six-inch fifty per cent cream bottles, set them up in a row, a straight row as nearly as possible and then get your shot gun out and see how many you can break at a time. Now those bottles are not fit to be used by any creamery man. There are some bottles fairly accurate. The nine-inch thirty or fifty per cent bottles are pretty accurate and the nine grams fifty per cent are quite accurate but not accurate enough for every day practice.

Prof. Larson: What would you use then if they are not accurate enough?

Mr. White: At the present time the only thing that you can do is to use what there is on the market, but we hope that the dairy authorities will get together and push the thing through and ask for the standard bottle, or prescribe specifications for a bottle, and then require the manufacturers to make them according to specifications.

Prof. Larson: Would you recommend a fifty per cent nine inch bottle or thirty and fifty per cent six inch bottle?

Mr. White: The thirty and fifty per cent nine gram, yes, or the nine-inch, thirty or fifty per cent. The nine-inch cannot be used in the ordinary test. Therefore, many creamery men have not felt that they would like to go to the expense of buying a new tester and yet it would be money in their pockets to do so.

Mr. ———: That is for cream; what would you use for milk?

Mr. White: The ordinary bottle used at the present time. It is graduated to ten per cent. It is not necessary to have ten per cent bottles for testing milk. I do not believe you have ever seen milk test ten per cent. The eight-inch bottle is much better because the graduations are farther apart and you can read the test much more closely. Some are graduated only six per cent in which the graduations, of course, are still

farther apart and you can make closer readings. If there is any danger of going above six per cent, of course, you could not use those. I have found a good deal of trouble with the mouldy samples, during the summer months when the composite samples are kept for two weeks or one month. This is expecially true where the tin top jars are used. If you prefer the tin tops, I would advise you to paint the under side of them with a good quality of paint before you use them. Such paint perhaps will last for a year or longer, while if you would use the new tops they would rust the very first month. The second month you will find rims of cream and mould mixed and it would be diffcult, or impossible rather, for you to dissolve the mixture and get a good sample. Leaky vats also cause leaks in the creamery and perhaps some of you have had expereince along that line. I know I have had, especially with the open vat which had water around the sides. Sometimes a large amount of water is run underneath the vat and will lift the vat up. Sometimes the vat breaks away from the tin and causes a leak. Very often we find pin holes in the tin Therefore, copper is much better for cream vats than tin. In fact I would not purchase a milk or cream vat made of tin. I would demand copper of a good heavily coated with tin.

One of the leaks is the separator out of balance. Invariably when the separator vibrates you can feel reasonably sure that it is not doing close skimming and it ought to be attended to as soon as possible.

A leaky churn perhaps is one great fault at the creamery. The cork around the cover comences to leak a drop or two one day and the next day a little more, and the next day still more, and so on until the butter maker becomes so used to seeing a few more drops leak out every day that he does not think it amounts to anything. Yet before he knows it, he may lose a quart or two quarts of cream a day.

The improper reckoning of cream is also a leak, as has been explained to you by the gentleman who preceeded me and I will not go any further with that.

The churn's running too slow is a serious difficulty in many cases and causes a great loss. The ordinary combination churn ought to run about twenty-eight revolutions per minute. If you run it very much slower than that it takes too long to churn and the buttermaker is apt to hasten the process by warming up the cream, and the result is that a large per cent of fat is lost in the buttermilk. We have saved from two to four-tenths per cent fat lost in the buttermilk by speeding up the churn to the proper number of revolutions.

Too thin cream is also a loss. We find a good deal of trouble with thin cream where farmers have hand separators. They seem to be of the opinion that they get a higher per cent, or I will put that in some other way; they seem to be of the opinion that they get better results if they take a thin cream than a thick cream. Now, this is all wrong, a creamery man will lose more in thin cream than thick. Besides that, the farmer is sending his skimmed milk, or part of it, to the creamery, which he ought to keep at home and feed to his stock.

Defective thermometers also cause losses. We have found in some cases that the buttermaker was using a theremometer that was inaccurate, perhaps 10 degrees out of the way. In some cases the buttermaker churned the cream at a temperature of 65 instead of 55, and lost very heavily in the buttermilk. Now, in this State you are making a great many prints. Perhaps most of your butter is put into print form, and we have found many losses by having prints over size. That is especially true in the smaller creameries. I cannot say that for some creameries, because in some places we find that the print only weights 14 ounces. However, I am glad to know that in this State you have a law to compel the creamery man to put out full pound prints.

We also find some trouble by over reading the tests.

I have received a good many letters from creamery men stating that they wanted to satisfy the patrons and therefore gave them one and two-tenths per cent more than the test actually showed. Now, I believe that this is a wrong practice, because the farmer does not know that you are giving him more than you ought to and he does not appreciate it. There is no reason why he should know, or why he should receive it. Now, if you want to give the farmer something, why not give it on the price, or why not give him a premium. Let us assume an example: Supposing a farmer delivered to your creamery 2,000 pounds of cream in a certain month and it tests 25 per cent. That is 500 pounds of butter fat, isn't it? Now, if you over-read the test two-tenths of one per cent that will be 10 pounds of butter fat, will it not? If that is worth 30 cents a pound you have given the farmer $3.00 more than he is entitled to. If you want to be good to the farmer why not give him an absolutely accurate test and credit him on his statement "premium $3.00." He will know then. So will you know what you are doing. If you follow the practice of raising a test it will throw your work out of line and you cannot check up your work. If you are low on over-run you will say, or the buttermakers will say it is because we give a higher test. That may be true to a certain extent, but it may not be the only reason for your overrun, and the only way I know to operate a ceramery is to give everybody just exactly what he is entitled to, and no more and no less. Then you can keep records.

Now anotehr loss is the leaky condition of butter. This is due largely to high temperatures. We find in a considerable portion of the butter going on the market during the summer months this trouble of leaky body, or in other words, the butter does not hold the moisture. The moisture is not distributed in the right way for the butter to hold it. The moisture may be low and yet the butter is not in condition to hold it.

Tubs not properly prepared also cause a considerable loss. Now I say not properly prepared. What would we consider proper methods for preparing tubs? There are just two methods that I would advocate. Now if you do not agree with me in any of these things I want you to speak out at any time. One method is to soak the tub. How? By having a tank large enough to hold one day's supply of tubs. This could be filled with distilled water, which can be drawn from any steam pipe. If you use water from the well it will soon become stale. Now this water should be saturated with salt and the water should be put in with the tubs. They should be soaked at least 12 hours. Tubs prepared in this way will be soaked uniformly through and through; if the ordinary method is practiced of setting the tubs out on the floor and filling them with water in the evening you know what the result is. The next morning, when you arrive at the creamery, some tubs are empty entirely, some of them perhaps did not leak any. Now, those that are empty did not absorb as much water as those that are half filled. Those that are half filled did not absorb as much water as those that are full. Consequently if you put butter into those tubs, those that did not absorb very much water will draw the moisture from the butter, even though the tub is lined with parchment paper. Not only that, but if you ship this butter to the market there will be a great difference in the weight of the different tubs and the probabilities are that you are going to be the loser. There used to be a method used on the market by a good many commission men of adding eleven pounds for the tub. If you have a tub that weighs less than 11 pounds, of course, you are going to lose, therefore we advocate soaking the tubs until they will weigh at least 11 pounds. Another practice that is demoralizing is to put the butter into a tub without any record of the amount, or in other words, to fill the tubs full and send them to the market and depend upon the commission men to tell you what there is in those tubs. I am glad to see a change along this line. Many creamery men are at the present time weighing a definite amount of butter into each tub. You perhaps know the way the butter is weighed in the market. A commission man puts a tub on the scale, we say a 60-pound tub, and the tub will weigh 11 pounds, therefore 71 pounds ought to be the gross weight. If it weighs 70 pounds strong he will be paid for 60 pounds of butter. However, if it does not weigh strong the weight is put back one pound because the commission men's scales are not graduated to ounces, only pounds. Therefore you may only be one or two ounces short and yet you lose a pound. Therefore, I will repeat again, that the creamery man ought to weigh a definite amount of butter into each and every tub in order not to have it deviate from day to day or year to year. There is no other article that I know of that is put up the way butter is. You can buy a barrel of salt, or coal, or lime, or anything else that you please, you will find a definite amount in the barrel or package of any character whatsoever, yet the creamery men have followed the practice of filling the tub regardless of how much there is put in. Therefore, there are a good many things along this line—

Mr. Larson: Mr. White, many of our creameries in this State are not packing butter in tubs, but are putting it in prints; what have you to say about that loss.

Mr. White: I just mentioned prints a short time ago, professor, and stated that there was loss in some cases by having the prints too large, but in many creameries that is not the case, but in this State you have a law compelling the creamery man to give full weight, and on account of the peculiar condition in the Philadelphia market you must have a print that is dry. Therefore, you cannot wrap the butter with wet paper. We may get to that a little bit later.

Now, I want to say just a word about keeping records. It has been only a few years since creamery men have attempted to keep records of any character whatsoever. As I started out to say, I do not know of any business that is run on such a poor business basis as a good many of our creameries. Now, I want to read to you for an example, and we have many of them, a letter that we received from one of these creameries. This gentleman says, "In reply will say we have not a set of books except our own make, and find it impossible to make any kind of an intelligent report, and never know what we are doing until the end of the month. We know this, however, that we paid $4679.41 all told, and are in arrears with our bank for several hundred dollars."

Now, there isn't any reason why a man should be in arrears with his bank without knowing what he is doing. Now, here is a creamery man doing a large business, receiving milk and cream, making butter and shipping it to the market and has scarcely a record. He has only a shipping book and a sort of cash book in which he has a report of the amount of money he has received from the commission man. Now, this was a co-operative creamery. I believe you have some co-operative creameries in the State of Pennsylvania, and as a general rule they are not operated in as businesslike a manner as those owned by individuals. However, I am glad to state that there has been a wanderful improvement among the creameries along this line in the past few years. If I were operating a creamery I would insist upon the buttermakers keeping a daily record. I would want to know from him the pounds of milk, the pounds of cream received every day, the test of the same, the pounds of butter fat received and what was done with it. I assume that some of your creameries in this State ship a considerable quantity of milk and cream. We have found some creameries where they have a contract to ship cream testing a certain per cent. In one instance of which I remember, a creamery had a contract for 20 per cent cream. Upon making a test of the cream that they had prepared ready to ship we found that it tested 26 per cent, and that meant a loss to the creamery of six pounds on every hundred pounds of cream shipped out.

Now, I believe it behooves the creamery man to know precisely what he does with every pound of butter fat he receives. If it is made into butter and shipped in the form of milk or cream, he should be able at the end of the day to know what he did with it, and at the end of the month he should have a record showing precisely what has been done. Now, some of you perhaps might say this is too much labor. Is is not,—it is merely business, and the creamery men must inject business into their work as is done in any other line of work.

Now, I want to speak to you just a few moments about overrun. I understand that you have had some discussion in this State in reference to that subject, and maybe we can get up another discussion. The question of overrun has puzzled a great many creameries. A few years ago we requested the creameries of the United States to send us monthly reports and we were astonished to see the actual conditions that prevailed in most creameries. They did not know what per cent of overrun they were having and in many cases they did not know how to figure the overrun. Now, I am going to tell you right off-hand what I believe is a fair overrun. If you do not agree with me I want you to say so. In the whole milk creamery we believe the overrun ought to be 18½ per cent; in the gathered cream it ought to be 21 per cent. Now, this allows for 14 per cent water, about 3 per cent of salt and 1 per cent of casein. If the testing is done accurately you lose only one-tenth of one per cent in the skimmed milk, which is too high. However, this permits of one-tenth per cent loss in both the skimmed milk and in the buttermilk, and you can get the overrun mentioned. If you do not get it, you can make up your mind there is something wrong. Now, this is for salted butter, not for unsalted butter. With unsalted butter the overrun would be about 3 per cent less.

Mr. ———: Would that mean butter in tubs or printed butter?

Mr. White: It does not make any difference, butter in tubs or prints. Printed butter can be made to hold out by very careful work. That is especially true in other cities than Philadelphia, where they demand, as I said before, a dry wrapper. In New York and other States they do not care for a dry wrapper and consequently you can soak the wrapper and make the weight hold out. In other words the wet wrapper will not draw any moisture from the butter. In places where you make butter for Philadelphia and must use dry wrappers, they will draw some water from the butter. Personally I prefer to wrap the butter in wet paper. The butter comes out much better than when it is wrapped in dry parchment, but I do not want to say one word against the Philadelphia methods, and if you are shipping to that market, I would advise you to make the butter the way they want it, and not what suits your own convenience. If you can do better, of course, it is your privilege to sell it wherever you can do the best.

Now, I will answer the question why you should get a higher per cent of overrun in gathered cream than whole milk. In the whole milk creamery the creamery sustains the loss of skimming the milk and whatever per cent of fat there is lost in the skimmed milk is paid for by the creamery. In the gathered cream the farmer skims his milk on the farm and he sustains the loss himself.

The President: Don't you think the loss sustained by the creamery in churning thin-gathered cream, instead of heavy cream, would offset the gain from churning farm skimmed cream?

Mr. White: Yes, in a good many cases. I am glad you brought up that subject of thin cream. There is no valid reason why the farmer should send thin cream to the creamery. We have endeavoerd to investigate this to some extent and find one of the principal reasons for thin cream is that the creamery man often is not careful enough in rinsing out the farmer's can and sends it out with some cream in it. That, of course, would be objectionable to the farmer and is not right.

Recently creamery men have endeavored to correct this trouble by having a small, clean receptacle or a jet of steam over which the can is placed. The steam mingling with the water will rinse out all the cream which in turn drips into a receptacle underneath. The can is thus returned to the farmer clean without any heavy cream adhering to it. Therefore, this method will do away both with the argument of the farmer and the cream that was left in the can.

I did not suppose there was a creamery in the State of Pennsylvania where cream was still measured with the pipette. If there are any creamerymen here who are still following that method I would advise them to order a scale before they go home and on the first day of February start over again in the right way. You cannot get accurate results by measuring the cream for testers, and, by the way, if you order a scale, order one that you can depend upon. A good many creameries have purchased a $4.00 cream scale and found that they could not get any more accurate results than they could by measuring. Then they condemn the weighing system, but if you have an accurate scale, which costs only $15.00, you can weigh the samples of cream and give the farmer what belongs to him, and give him satisfaction and satisfy yourself.

Mr. Smith: I would like to ask in regard to thick cream. When a farmer churns his own cream is it to his advantage to have thick cream?

Mr. White: Yes, but we had better establish what a thick or thin cream is first. Let us take a basis of 30 per cent cream as a reasonable thickness, 30 or 35. Does that answer your question?

Mr. Smith: Yes.

Mr. ———: Suppose you had a cream that tested 20 to 22 per cent, would there be any noticeable difference in the test if the cream was measured with a pipette instead of being weighed?

Mr. White: The difference would be slight, with cream testing between 20 and 22 per cent. However, in your method of mixing a cream you may incorporate a certain amount of air, and if you do, of course, you do not get the proper weight of cream by using a measure. In weighing, it does not make any difference how much you agitate the cream; you could always get the accurate weight. Therefore, even with 20 or 22 per cent cream it would be decidedly advisable to weigh it. I have made some tests of 20 per cent cream and I could not read any difference. They were both about the same.

The President: I found little practical difference in 30 per cent cream between weighing and measuring; I have tried it many times.

Mr. White: There is. Careful tests have been made in the laboratories; I do not know that I can recall them now, but there is quite a little difference; it seems to me that there is something like two or three-tenths per cent difference in 30 per cent cream between weighing and measuring. Why, it is reasonable to believe that there should be. The specific gravity is so much different and the weight is so much different. Now, let us apply that in a larger way: Ten gallons of cream that tests 20 per cent will weigh about 83 pounds. I believe it is 83 and 3-10ths. Cream that tests 25 per cent will weigh only 81 pounds or there would be two pounds difference to the can. The richer the cream the less it will weigh. Now, in the every-day practical creamery I don't know that it would be advisable to take that into consideration, but the fact still remains that there is that much difference, and enough difference between weighing and using the pipette that it would throw your work all out of line and you would not be able to keep track of it.

The President: Understand that I am not an advocate of measuring. I am an advocate of weighing, but in my tests I have found little difference until you pass the 30 per cent mark. I do not mean to say that 31 would make the dividing line, but when you get rich cream I find measuring and weighing make great deal of difference. Up to 25 per cent cream I have found very little difference; from 25 to 30 more decided; and from there on up quite a difference.

Mr. White: What kind of bottle did you use in making those tests?

The President: I will state that I have an intsrument to test the bottle. I used a bottle that I tested with this instrument, which was furnished by one of the dairy firms; I could not tell you which one, but the instrument was guaranteed to be accurate, and I did find by trying that same glass that was sold to me that the bottles were absolutely correct.

Mr. White: Even then you would use that instrument; what was it?

The President: Simply the neck.

Mr. White: It displaces the amount that ought to be in the fat. That is not the only thing to be taken into consideration, but by the use of that you may feel that you are getting nearly accurate results. Let me ask again what size bottles did you use—six-inch?

The President: Yes, six-inch.

Mr. White: Fifty per cent?

The President: No.

Mr. White: Thirty per cent.

The President: Yes, and with heavier cream than that I would take nine drams.

Mr. White: Even with those I doubt very much if the experiment—

The President: Would bear out on account of the glassware?

Mr. White: Yes.

The President: Then we are up in the air?

Mr. White: Yes.

Mr. Granaham: I would like to ask you in a test of cream, where there is a well-defined meniscus, where we should read the bottle?

Mr. White: How to read the meniscus or the top of fat column in the cream bottles? Various authorized works, such as Professor Farrington's, give different directions. They have issued 18 editions of their book on testing. The first 17 issues of it say we are to read the butter fat column from the extreme top to the bottom. A large number of creameries throughout the United States, of course, have those books in their creameries and use them and follow them very closely. However, the eighteenth edition tells you to read from the bottom of the meniscus to the bottom of the cream line or, in other words, to eliminate the curve entirely. Now, that will give you better and closer reading than if you read to the top. If you read to the top you are going to be the loser all the time. You will give the farmer more than he is entitled to. Webster and Gray made some experiments on this subject, reading four-fifths plus two-tenths; but that is too complicated for the ordinary creamery man, and Professor Farrington advocates reading from the bottom of the meniscus as a general proposition; that is nearer right than anything else we have heard of.

Mr. ———: Would you do the same for milk?

Mr. White: No, not for milk, because the neck of the cream bottle is so much larger and the meniscus is so much greater.

Now I see a gentleman here that is on the program and he should have taken the floor when I took it. I don't want to encroach upon his time, and therefore will leave the floor unless there is some question.

Mr. Marshall: How would you prevent leaky butter?

Mr. White: That is a good question. I am going to tell you this in as few words as I can. You must get your temperature down to where the water is distributed throughout the butter without leaking out.

The cause of leaky butter is either too much water or water not properly distributed, and you can regulate that largely by churning at a lower temperature. I want to say further, that a pasteurized cream will not show these conditions as much as raw. In the raw cream the butter fat globules are in clusters and consequently there is more place for globules of water. In pasteurized cream the clusters are separated and each globule is by itself and you can incorporate the water, or the water wil lbe distributed more evenly through these globules than through the clusters.

I am very glad to have this pleasure of being with you, and I want to apologize for not being here last year and the year before. I did not expect even to get another invitation to come to the State of Pennsylvania, because I had disappointed you twice, but Professor Van Norman seems to stick to a proposition with particular tenacity and wrote me for the third time, and I replied that I would not disappoint him this time. I thank you for your attention.

The President: I want to say that is the best practical address I have heard in a dairy meeting. I do not like to say that, but I have to be honest in my views, and I say that it is an address that came from one who knows. You have been in a creamery in your time, and worked in a creamery and know what you are doing. I have noticed very particularly when a certain question is asked you about some of the things that are pretty intricate for us to find out for ourselves you understand what we want to know and in good language tell us quickly what we want to know. I thank you very much for the address, it has been very interesting.

Mr. White: I want to thank you for the compliment.

The President: Not at all, it was deserved or you would not have got it.

The President: Ladies and gentlemen, I am pleased to introduce Mr. Slater. He has done a great deal toward the betterment of the butter situation in Minnesota. They tell me he is another practical man, so get your questions ready. The subject that Mr. Slater will address us on will be "The Oleo Situation." That is a fad of Mr. Slater's, I understand.

THE OLEO SITUATION.

E. K. Slater, Sec. National Dairy Union, St. Paul, Minn.

It is not only a fad but a hobby, and when you see a man riding a hobby around you know he is keeping himself pretty busy. We have different hobbies, but they all have their uses. I am sorry that I had to make the President disarrange the program, but I am glad to be with you today. I can bring to you, I believe, without fear of getting myself into trouble, the greetings from the dairymen from the West, and you can make that cover just as much territory as you wish to; I can bring to you particularly the greetings from the dairymen from Minnesota. I am not going to attempt to tell you here today how good a State Minnesota is, or anything of the kind. It is a mighty good State when you get down to it. It is quite a ways down to it just now; it is covered with a whole lot of snow. We turn out some mighty good men in Minnesota. I am not a Minnesota man, so don't misunderstand my remark. But Ben White, your former speaker, is a Minnesota man. I just want to say Amen to what the President has said. I know him and know of him for a good many years. This is a little arrangement White and I have made between us, but don't let it detract from the force of the remarks I am making. He would probably have said something good of me if he had thought of it.

Mr. White: You don't know but that I did, you were not here.

Mr. Slater: I imagine probably this oleomargarine question is a live one with you. As your President has said, it is a hobby with me. I am giving my whole attention to the question, attending all the dairy meetings I can and in my humble way explaining the things that the dairymen stand for. If you will give me about 20 minutes of your time I will outline to you just what the National Dairy Union is attempting to accomplish. At the present time it is attempting to accomplish only the education of people as to the real issue that is before the people in this oleomargarine controversy. I assume that every person heer this morning knows what oleomargarine is. I have been giving it a good deal of study and if you were to ask me what oleomargarine is I would not be able to give you a definietion. It is just whatever happens to be the result of the mixture of fat and oils from different sources. The conglomeration is colored yellow and called oleomargarine, that is when they have to call it oleomargarine; it is called butter under all other circumstances.

In order to make myself perfectly clear here this morning I want to use the simple statement, in fighting the dairymen's battles along this line the National Dairy Union is fighting yellow oleomargarine, nothing more or less. Now, it is not my wish to burden this convention with the abstract condemnation of oleomargarine, or oleomargarine manufacturers or anything of the kind. I wish rather to point out a few concrete facts by reviewing the claims made by the dairymen through their national organization, the National Dairy Union. When Congress passed the present oleomargarine law, imposing a tax of ten cents upon the artificially-colored oleomargarine and one-fourth of a cent per pound on oleomargarine not colored, it was the intention of Congress to eleminate it, drive it off the market, or at least to make the produtcion very expensive. What is the result? After eight or nine years' enforcement of that law, probably 75 per cent of oleomargarine that is going on the market is yellow, and now I will quote some figures from the Treasury Department at Washington: Less than 3 per cent of the yellow oleomargarine put upon the market was taxed at 10 cents a pound. If you do not remember anything else that we say or do this morning, I say, please remember this, that less than 3 per cent of the 150,000,000 pounds of oleomargarine put out last year, or one pound for every nine or ten pounds of butter put on the market was taxed at 10 cents a pound. The other 97 per cent and over was taxed at one-quarter cent per pound. Then the oleomargarine men claim, and, of course, it is a good argument for them, that the 10-cent tax is what is keeping butter so high. The argument has been knocked in the head the last week or two by the prices of butter having taken a tumble. That has been the chief argument. The present oleomargarine law then has failed to keep yellow oleomargarine off the market, and some new measure or amendment to the existing law must be adopted by Congress to prevent fraud in the sael of oleomargarine. At the last session of Congress several bills were introduced, some introduced by your Congressman from Pennsylvania. A Congressman from Wisconsin introduced a bill amending the present law, strengthening it, and Senator Penrose also introduced a like measure in the Senate. I believe at the present time a Congressman from Pennsylvania has introduced another oleomargarine bill; but the two first mentioned I construed as being favorable to the dairy side of the controversy. They are made to prevent fraud. I shall go over this hurridly and touch upon the salient points. I hope it will not be too dry. Any time you wish to pull upon the string do so and I will quit. I will try to cover the salient points, because if I would go into details in this matter it would take more time than you or I wish to use.

All those bills introduced in Congress that are favorable to oleomargarine propose to allow the sale of yellow oleomargarine. That is the thing they are fighting for, and the dairymen are fighting against it. Of course, they provide for the original package and the internal revenue stamp. They say, "We will have this put up in one, two, three, or five pound packages, wrap a revenue stamp around it" and provide a heavy penalty for the violation of the law which will require that that product must not be removed from the original package until it is used. They are willing to agree to a two-cent tax on the product—in fact, gentlemen, they are willing to agree to almost anything so long as they are allowed to color their product to look like butter.

Now, some of our own people are being misled by this original tax. I believe dairymen as a class,—perhaps I am prejudiced,—but I believe as a class we want to give the other fellow all that is coming to him, and in the desire to do that a good many of our own people are standing up so straight that they are leaning over backwards and in this original package see, or think they see, a solution of the question. I remember when the question first came up last wniter; it was before I had given very much thought and attention to the question; I was being myself misled by this original package scheme. I thought that would insure its going out on the market and always being sold as oleomargarine; if it were colored yellow there would be no harm done so long as sold as oleomargarine. I remember going to Professor Hammar, however, of Minnesota, and I put the proposition up to him; he was busy that afternoon and he said, "I haven't time to discuss it," but he said, "Who proposes it?" I said, "It is the oleomargarine fellows." "Then," he said, "we do not want it." Now, that was a pretty homely argument, but a pretty sound argument nevertheless, and now I just want to point out the reason why that original package scheme would not prevent fraud in the sale of oleomargarine. In the first place it would not regulate the sale of oleomargarine i nhotels, restaurants and boarding houses, where millions of our people eat. It is argued that the State law ought to regulate that. Very well, but I will answer that with this simple question. If the State law can regulate it, why is it necessary to pass a Federal pure-food law? Now, the second proposition is this, and perhaps it is the most important: The Internal Revenue Department at Washington, the department that necessarily would have the enforecement of the law, is purely a tax collecting department and is not interested in the question of fraud, except where fraud is commited against the Government, by avoiding the payment of a specific tax. They could not possibly be interested in the question of fraud where oleomargarine is sold as butter. Their business is simply to collect revenue. If we had a uniform tax of two cents on oleomargarine the only thing that the department could be interested in would be to see that the oleomargarine manufacturers paid the tax of two cents a pound, and after that tax was paid into the government treasury the Revenue Department would lose all interest in the proposition.

Here is the third objection to the original package scheme: If that law could not be framed so as to enable the Government to prevent the hotel men, restaurant men, and boarding housekeepers from removing this oleomargarine from the original package and selling it to their guests as butter, how could the law consistently prevent the peddler going from house to house and doing the same thing. It is argued a heavy penalty would prevent irresponsible fellows from doing that. What is the use of the penalty when you have no part of the administration of the Government to enforce the penalty?

The fourth proposition is this: That the majority of our State law making bodies and the majority of law making bodies in foreign countries have attempted to regulate the sale of oleomargarine by controlling the color line. That is a pretty good precedent to go by but the reason why the State falls down in the enforcement of such a law is because the Federal law is not similar to the State law. I believe you have that same troubel right here in the State of Pennsylvania. Now the argument is put up that the oleomargarine people should enjoy the same privilege of coloring his product as buttermakers do, and some of our own people are misled there again; they can't see why if the buttermaker is allowed to use artificial coloring in his product, the oleomargarine manufactuerr is not allowed to do the same thing. Ladies and gentlement, I want to lay this statement down as a good sound pure food proposition: If it is necessary to do a certain thing to drive out fraud then that certain thing should be done. If it is necessary to prevent fraud in the sale of oleomargarine to wipe out oleomargarine altogether then that should be done. I lay that down as a pure food proposition; but I am not claiming that that should be done, and I believe that there is not a dairyman in the country who does. All the dairymen are asking for is the privilege of putting upon the market a yellow butter and denying that privilege to the oleomargarine manufacturer. I am going to prove in one point to the convention that the dairymen have the right to ask that privilege and the denying of it to the oleomargarine manufacturer. Here is the reason for it: The natural color of butter is yellow. No one is going to deny that. The oleomargarine men themselves admit that the natural color of butter is yelolw. Butter is more yellow during certain seasons of the year, and from certain breeds of cows it is a deep yelolw the year round. The maker of butter uses a small quantity of artificial coloring matter in order to preserve the natural color of butter the year round. It is still butter after colored yellow and it is not sold for something else. When the oleomargarine manufacturer colors his product yellow, he does not color it to give it its natural color; he does not color it to preserve uniformity; he colors it to make it look like something that it is not. Before the cow was domesticated she gave milk only during a few short weeks in the summer season, just enough to support her off-spring, and at that time of the year we know that the butter oil in her milk was yellow. Only man's development of the cow has made it necessary to use artificial coloring matter at certain seasons of the year in order to keep its natural color the year round. In the attempt to prejudice the people against Federal legislation that is calculated to prevent fraud in the sale of oleomargarine, manufacturers have claimed oleomargarine is the poor man's butter and that the tax of 10 cents a pound upon it is a burden upon the laboring classes. You hear that supposed argument advanced very much. I lay this proposition down: If oleomargarine is to be the poor man's butter, it must be sold to him as oleomargarine, and at eleomargarine prices. When it is colored yellow and sold to him at butter prices or nearly so, it ceases to be what is claimed for it. Go upon the market and you pay more for yellow oleo than you will for white oleomargarine, whether it is sold to you as butter or eleomargarine. Yellow oleomargarine always sells at prices of butter, or nearly so, whether sold as butter or oleomargarine. It is no less than insulting to insinuate that the American laboring man is in favor of fraud and deception in this matter. It is no less an insult to him to insinuate that he cannot afford to put pure food on the family table and that he must be pointed out as a user of cheap and adulterated food. As a matter of fact no better butter market exists than you find in communities where poor classes of laboring men predominate. Oleomargarine manufacturers claim that they are the sponsors for the consumers in the country in this attempt to repeal the present law and that the dairymen are selfish, that they are not satisfied with the price of butter that has prevailed the past few years, and that they want to create a monopoly and boost butter prices higher. We heard a great deal of such talk at Washington before the House Agricultural Committee, where the hearings on the different bills were being held and that was one of their big arguments in trade. They go before Congress pretending that they represent the consumers of the country and that the dairymen represent the pecuniary interests.

Let us analyze that. Who is the selfish man? Is it the man who wishes to create conditions where food products can go upon the market and sell through merit at consistent prices created according to the supply and demand, or is it the man who wants to create conditions where the consumer can be more easily defrauded and humbugged? When the arguments of these people are analyzed there is only one sensible conclusion to which a person can come: that they are not seeking to protect the consumer; they are not seeking to get a poor man's butter upon the market; the are seeking to create conditions whereby that consumer can be more easily humbugged than they are at the present time. What are they claiming the dairymen are selfish about at this time? I am presenting these arguments so that you can use them in refuting the claims that are put up to you in your every-day wor, because they will certainly come up as they do in conversation. What is the dairyman asking for? Simply asking for conditions that will provide that oleomargarine be sold as oleomargarine, and butter be sold as butter, and that they both be sold at a consistent price. I make the claim without reesrvation this afternoon, that it is impossible to regulate the sale of oleomargarine and prevent fraud without controlling that color line, and if some one will show me wherein I am wrong, or where the other dairymen of this country are wrong, then it will be time enough to talk that kind of a proposition. The only thing the oleomargarine men are striving for is the coloring of oleomargarine. So far as the development of their business is concerned, the situation at the present time is entirely satisfactory to them, and let us not forget that. Their business increased last year from less than one hundred million pounds to over one hundred and fifty million pounds, an increase of 50 per cent. That is pretty good for one year. They are entirely satisfied with the present conditions, except that their product is pointed out by the Congress of the United States as a substitute for a genuine article, and if they could secure legislation which would be favorable to their side it would simply be placing the stamp of approval of the United States Government upon their product, and that is really what they want. It is not the elimination of that 10-cent tax; the product is only paying a quarter of a cent tax. The present situation is entirely satisfactory to them, except that they desire to go to the people of the country and say that Congress has put its stamp of approval upon their product by eliminating this outrageous 10-cent tax that makes butter cost the poor laboring men just 10 cents a pound more than it ought to. If the statement is true that they make, and butter were 10 cents a pound less than it is today, there would not be much profit in the dairy business. But we know that the 10-cent tax has absolutely nothing to do with the price of butter, no more than the man in the moon has had anything to do with the price of butter, because oleomargarine has not been taxed at 10 cents a pound.

I lay this down as a warning to the dairymen, that he should not fight the oleomargarine as such. Now, I believe I have been in a position to learn the sentiment of the people of the United States and I have a very wholesome respect for the sentiment. I believe in majority rule, and I want to tell you friends here this morning, that the sentiment of the people of the United States is against this 10-cent tax on colored margarine. Why? Simply because they do not understand that oleomargarine is not taxed 10 cents a pound unless colored. The hysteria in regard to the high price of food products that has prevailed over the country in the last few months has been responsible for calling attention to this supposed tax on all oleomargarine, and the oleomargarine manufacturers have been acute enough—I admire them for that—they have been acute enough to spread the false idea tall over the country and encourage the people's prejudice along that line. I believe when the consumers of the country really understand that the dairymen are asking only for the elimination of coloring of oleomargarine, then we are going to secure that. When this question is settled, it is not going to be settled on the basis of what is to the advantage of the dairyman. We may just as well get that idea out of our heads. Congress is never going to get this question right if they settle it for the particular benefit of the dairy industry, the oleomargarine people, or the poor laboring man.

I will tell you what basis it is going to settled on, and that is on the basis of what is just and will prevent fraud upon the consumers. I want to make this statement here this morning, that when it is settled in that way, if the dairy industry cannot survive then that industry is not founded on the correct principle. I do not believe that dairy men can afford to use their power at Washington, which is appreciated at its full value by the most skilled politicians for asking anything that is unreasonable, and I do not believe that dairymen can afford to be put in the position of light of asking for anything that is not reasonable. I found that what you should ask for is simply that fraud be driven out of oleomargarine. Let them sell it if they want to. Let the people eat it if they want to, providing it is put out in its natural color and the consumer, no matter where he may be, knows that he is eating oleomargarine when he eats it. If we can get the question settled on that kind of a basis, and if the dairy industry cannot survive, then it is not founded on correct principles. If we will stand on that kind of a platform there can be just on result in this fight. It has been a long fight; it will, I believe, be a still longer one for you people who come here and talk about what must be done to drive out fraud in the sale of this substitute. I do not believe these dairy men should speak of oleomargarine as a competitor of butter, because it never can be. No sane person, providing they will give thought to this question, will agree with the argument advanced by the oleomargarine interests that oleomargarine is as pure, wholesome and nutritious as butter. If you could read my thoughts you would see I have these three words in quotation marks—pure, wholesome and nutritious. We heard them so much at Washington last spring that I never can forget them myself. The claim of the oleomargarine people is that oleomargarine is a pure, wholesome and nutritious product, and is being discriminated against by the Government of the United States. And I say no sane persons will agree with that argument provided they give thought to it. Leave the ingredients natural to butter out of oleomargarine and you have a product that will neither taste, smell or look like butter, and the cost of producing oleomargarine is regulated by the amount of butter that goes into it. Just as the amount of butter in oleomargarine is increased the price of the product is increased, and the value advanced. Then it is not foolish to claim that the product is just as pure, wholesome and nutritious as butter? Let me urge this in conclusion, that we just stand upon the principle of driving out fraud and nothing else and maintain that stand all the way thorugh. We are then standing on the solid rock against which nothing can prevail all we are going to win.

Friends, I have been asked to recite a little poem here that I have used before in meetings in the West. I have never before been guilty of using it here, yet I believe I am running a little risk, because there are one or two men in the hall that have heard it before. I have been warned out West that if I ever repeated the offense I should suffer, but probably you have not heard it. I should have given it to you in connection with that greeting that I brought to you from the dairymen of Minnesota. Perhaps you know that before you can become a full-fledged citizen of certain districts in Minnesota you have to learn to talk the language. This little poem that I am going to recite is intended to show the feeling that the Scandinavian farmer has for the old brindle cow, and it is supposed to have originated in Freeborn County, where our friend White came from.

The President: Ladies and gentlemen, are there any questions you would like to ask Mr. Slater on the very interesting address he has just given us? If not, I will announce that this afternoon when Mr. White gives his address on market requirements of creamery butter—— .

Prof. Van Norman: It is fifteen minutes before noon and this is the only time we are going to have to give to the creamery subject. There are three first-class men on the program and I would not like to take this adjournment of the meeting before twelve o'clock without giving a chance to ask questions. I am sure somebody must have a question to put to Mr. White and Mr. Slater.

Mr. ———: I would like to ask Mr. Slater if they use anything else beside the butter product and oil?

Mr. Slater: They secure the ingredients that make up oleomargarine with the view of getting that color even at the sacrifice of quality in the product, and the popular ingredient is cotton seed oil. They use an unrefined grade of cotton seed oil; that is where they get most of their coloring from. They also use different ungraded oils, selected with this purpose in view. Where they turn out a high-class product, the coloring is comparatively easy. They use a large quantity of uncolored creamery butter. They buy it up during the summer season on a contract with the creameries requiring that no artificial coloring matter shall go in the product and that is used for the purpose of coloring. As a matter of fact, the poorer the oleomargarine, the higher color it has. That answers your question. If they do not get the coloring they use butter. They use a larger proportion of this unrefined cotton seed oil, which lowers the quality of oleomargarine. In making that statement I am quoting an oleomargarine manufacturer's testimony at Washington. If I may just touch upon that cotton seel oil proposition—they have attempted and succeeded to a certain extent to array certain cotton growers against the dairy men. They point out in their shrewd way to the cotton growers of the south that with the manufacture of oleomargarine there is a market for their cotton seed oil. Now, absolute facts, statistics gained from the Department at Washington, show that for the cotton seed oil used in oleomargarine last year the cotton growers of the south received the magnificent sum of one-half cent an acre. If the oleomargarine people were allowed to artificially color their product without paying this higher tax, they would quit using cotton seed oil, because just as soon as they use it it lowers the quality of their product. I believe that when the question is eventually settled on a basis where it is going to stay settled the oleomargarine manufacturer will strive for quality in his product just as much as the butter men will, because it will be a dollar and cents proposition with him. They are using at the present time that unrefined cotton seed oil for the purpose of getting the yellow color. The color is worth more in oleomargarine than any other factor.

Mr. ———: They say in the literature that the oleomargairne people can't stand the tax on the oleomargarine. Is it not a fact that the bill now before Congress (if it were to pass) will make the tax about eight times as much as it is today?

Mr. Slater: Yes, the question answers itself. The bill proposes a tax of two cents a pound. At the present time oleomargarine is taxed a quarter of a cent per pound, and I can't see why this pure, wholesome and nutritious product should be taxed two cents a pound. If the tax is not for the purpose of driving out the fraud for which the ten-cent tax was intended, what is the use of taxing the poor man's butter two cents a pound? I don't think it should be taxed; I would rather see the tax at a quarter of a cent a pound. That is enough to bring it under the supervision of Government authorities, and then drive the fraud out of it. Don't tax the poor man's butter. The tax that these people are condemning, they propose raising from a quarter cent to two cents a pound. As I have said before, they are willing to do anything as long as they can color it yellow.

They use milk and cream in churning the oleomargarine up in the factory; that is one of their processes I did not call attention to. They get the the same result as if they put the butter right in. Then, of course, they introduce casine, that is, simply mix butter products with oleomargarine.

The President: I would just say that at this afternoon's session Mr. B. D. White, of Washington, will give us an address on "Market Requirements of Creamery Butter," and during that address the butter that is here on exhibition will be brought into this room and scored by Mr. White. You will find the address very interesting and practical, especially as it will be given in connection with the scoring of the butter.

Adjourned until 1:30 o'clock p. m.

AFTERNOON SESSION.

January 25, 1911.

The President called the meeting to order at 1:30 p. m.

The President: First on the program will be an address by Mr. E. K. Slater on "The Value of Traveling Dairy Instructors." He is the same gentleman that spoke on the oleomargarine question this morning. I take great pleasure in introducing Mr. Slater.

THE VALUE OF TRAVELING DAIRY INSTRUCTORS.

E. K. Slater, St. Paul, Minn.

I feel that I owe you an apology for attempting to talk to you on this question. I did not know until I struck town this afternoon that I was to talk to you more than once today. You can see that my intentions were all right. It is not your secretary's fault, however; he spoke to me sometime ago, but, as I recall, asked me to discuss some other question, and I told him that I was always willing to talk whether I had very much to say or not. A few days ago he sent me one of your programs. I should have looked at it, but I did not. I remember his telling me a few days ago I was to be here on Wednesday. I am not prepared to discuss this question, but perhaps I can open it for discussion. I believe it to be a thoroughly important one.

Perhaps in order to make myself perfectly clear to you I should tell you just what experience I have had in this line. That will give you the reason perhaps for my referring to Minnesota as I may do from time to time in the short talk that I shall try to give you. I was not born in Minnesota, but raised in Southern Minnesota on a dairy farm, and have always been in the dairy business. I was not only raised on a dairy farm, but I worked as a hired man on a dairy farm and I courted my wife on a cow farm. I just want to suggest to any of you young fellows this afternoon that if you have got that job ahead of you, there is no better place to court a girl and be sure of what you are getting than on a good cow farm. I operated a creamery several years in Southern Minnesota, and for the last eight or nine years I have been spending my time in State work. Now, I mention this for the purpose of trying to impress upon your mind that I have had some contact with farmers. When we speak about the value of traveling instructors we must necessarily include the instruction that we hope to give the farmers along dairy lines. Now, I know farmers; I think I do, and so I know the kind of instruction that they will welcome, and the kind of instruction that they will resent. Unwelcome instruction is of no value whatever to the man whom we hope to instruct.

Perhaps I had better outline briefly the plan of dairy instruction in Minnesota and then point out where I believe they are at fault in that State, and where you may profit by their experience. I mention Minnesota because I am acquainted with the situation there, and because the State has done so much toward educating dairymen to keep better cows and produce better dairy products. We have a State Dairy and Food Department in Minnesota. The Commissioner is appointed by the Governor and usually because of his value to the Governor in the previous campaign. I understand you do not have politics in Pennsylvania, but we have in Minnesota, and we have had that to contend with. I have held the office a few years myself, and I know what a man has to be and to do in order to get into office. The department in Minnesota has inspectors. I understand that according to the Constitution in the State of Pennsylvania, they cannot have inspectors in State service. In Minnesota they are known as inspectors and most of the educational work that has been done by traveling men from various counties has been done by inspectors of the State Dairy and Food Department. Now, I am happy to tell you that these inspectors are not politicians; they are men selected under a civil service law and must be trained men in order to get the position. They must give wholesome instruction to the dairy men of the State and do good effective all-around work in order to hold those positions. The result has been quite satisfactory. The Commissioner has supervision over these men, but only to direct their work in an administrative way. Some of the instruction work has been done under the supervision of the dairy school at the State Experimental Station, but most of it has been done by the inspectors.

Now, I want to make myself perfectly clear and be consistent in whatever I am telling you. I first want to lay this proposition down that I believe where it can be properly carried on, the instruction among farmers and buttermakers is more effective where there is a police power back of it. That is the reason I think the work has been so successful in the State of Minnesota and other States that I have been more or less connected with. In considering the student it is usually a pretty good thing to have a club lying close by to hammer the instruction in with. Buttermakers, cheesemakers, creamery patrons and factory patrons are only boys grown up. The same kind of discipline that is so effective in the child at school, depending upon the nature of the child, is often just as effective upon adults, and this police power back of the instruction, I believe, is a mighty good thing.

I might suggest that in a State like this, where you canont have the inspectors, your work might be carried on through the State Experimental Station. These instructors should have some sort of police power back of them, granted by the State Board of Health or State Dairy and Food Commission. Please don't misunderstand me. In a majority of the cases this police power is not necessary, but it is only to bring the erring ones up with a jerk when necessary. I believe that when the buttermakers and dairymen know that the man who is going from factory to factory and from dairy to dairy has this police power back of him, and has the power to bring offenders into court and subject them to fine or imprisonment or both, it has a very wholesome effect. They treat him with more respect. I believe that the State Dairy Schools, or the dairy division at the Experimental Station is a better fountain from which this information shall come than the Dairy and Food Department. The latter is mixed up more or less in politics, as it is in Minnesota. If you can in some way give to these instructors sufficient police authority for this wholesome moral effect upon the man in the business, it will be a very good solution of the situation. In fact I believe that an arrangement of this kind would be even better than the arrangement in Minnesota where it is done by the Dairy and Food Department.

I am very much in favor of the enlargement of the activities of our dairy department at our universities. I have been connected with one of them in the last two years, and know the kind of instruction that they aim to give. Now, I will pass on and lay particular emphasis upon the kind of instruction that it to be given to the buttermakers and the dairymen in this kind of work throughout the State. I believe that I am speaking to a sympathetic audience when I mention this, because we know that upon the progress of agriculture depends the ultimate success of a State, even like Pennsylvania, with all her mineral wealth. We must encourage agriculture, and there is no branch of agriculture today that we need to encourage any more than the dairy business. To the kind of instruction that shall be given it is necessary to give great thought and conisderation.

Now, the trouble in delegating this work to the agricultural college—I am going to speak frankly—is that the agricultural college is liable to make the mistake of putting inexperienced men in the field to educate the dairymen and the buttermakers. They may have the theoretical knowledge to do that, but they have not the tact and personal magnetism about them to get next to the man that is to be educated, and the result is that conditions are made worse instead of better. There is a great obstacle to overcome, if you please, in delegating this work to our agricultural colleges, and I say it with no disparagement whatever to the agricultural colleges, because they are doing the best they can. When that work is delegated to these institutions, there should be some method employed by this organization, if you please, to see that men of the right personality and right training are put in charge of the work.

Now, I have seen many young fellows fail in their efforts to revolutionize the dairy business in particular localities. I have been connected in my work for several years with the various schools. Every year we turn out from one hundred to one hundred and twenty-five bright, clean young fellows who have served their apprenticeship in the creamery. If they do not get anything else in the time they are in that school, they get chuck full of enthusiasm and go out with a determination and a feeling that they are able simply to revolutionize the dairy business in the locality into which they are going. The result is they begin at once to tell the farmers just where they are making the mistakes and what methods they should employ to get more milk from their cows and how they should take better care of their milk and cream. I have in mind now one young man who has been several years in gaining his experience. He frankly admitted that when he finished school and went to a certain locality in Southern Minnesota his intention was to transform the community from that of ordinary farmers carrying on the dairy business as a side issue, to a community devoted exclusively to dairy farming. He was going to do it in a few months. Now, I have always admired the young fellow's enthusiasm. His heart was right, but his mind was wrong; and there are many fellows starting out to do that very thing. If I wanted to go on and be still more frank with you, I could quote from my own experience.

So it is very essential that the men who are to carry on this instruction shall be men that are thoroughly trained for the work, not only theoretically trained, but trained along practical lines. Now, I do not believe that it is possible to take a city-bred young man and put him through an agricultural college and send him out to instruct farmers with any hope of success. He will be the exception to the rule if he makes a success of it, especially if the farmers find out that he came from the city. But it is not necessary to do that. This work can be started by having one or two men of training and experience who know how to approach farmers, and when I say men who know to approach farmers, I mean men who know how to approach any other class of United States citizens, because when everything is analyzed we find about the same kind of human nature running through different people, no matter in what business they may be engaged.

I am not throwing boquets at farmers, and I am not going to throw any bouquets at buttermakers. I am not throwing any bouquets anywhere, but I do like to call things by their right name. I might go on and state, as I guess I will, that the farmer is generally looked upon as a man who would not do anything out of the way. However, if I may enjoy the liberty of indulging my observation it is this, that if I would want a good job of skinning done, I would just as soon pick out a farmer to do it as any man I know of. On the other hand if I would want to find a good, wholesome citizen I would just as soon look among the farmers to find him, as to look among the buttermakers, and I am a buttermaker. The business we are in has very little to do with the kind of men we are. A farmer is just as intelligent in his line of work as the majority of people in theirs. You can term him a hayseed or whatever you please, but the fact remains that he is a reading, thinking citizen. You send out an experienced man to insrtuct him how to take care of his cows and cream, and after all is said and done possibly it is up to the instructor who is doig the work, whether he is going to get next to that farmer or not. The instructor cannot get next to him in any beter way than to have that practical training included in his experience. The amount of hair he has on his head has little to do with it. Some of our best dairy instructors in the Western States are young men, but they are men who are trained along practical lines as well as theoretical lines. When they tell a farmer he should feed ensilage to his cows in order to get thick milk and lots of it, they are able to tell that farmer how to produce that ensilage from the time the crop of corn is put into the ground. If an instructor cannot dispense that kind of instruction he is not going to be on the farm fifteen minutes before some hayseed trips him up and shows him he does not know what he is talking about, and when the confidence of the man who is to be instructed is once lost, then the instructor will be of very little value.

I wish I might emphasize that still more, but I do not know how. I know that the thought will be seconded by everyone here, and I want to emphasize it so that you will take up this work. There is a general awakening in Pennsylvania as to the necessity of encouraging dairying and agriculture in general, and with this awakening you will have to give this instructional work in the different localities.

Perhaps I ought to go into detail a little more to indicate how that should be done, and I will do it very briefly. In the first place this work can be helped along by holding a large number of local dairy meetings, and the man or men who are responsible for carrying on the work must be sure that the right kind of speakers go to that meeting so that the interest of the farmers may be kept up. We have made that mistake in lots of sections in the West, where we have been holding too many dairy meetings. The result has been a lot of incompetent men have gone to those meetings and discouraged the farmers, and now you cannot get them out to a meeting under any promise or method of coercion. So you must be careful not to make that mistake. Hold a few district meetings; let them be well advertised and you will have them well attended. Get up a discussion along common lines and have the men there that will be competent to do it. In an annual convention such as you have here, you talk these matters over, and you go home and forget them and nothing is done perhaps until next year. That kind of dairy instruction is not very effective. You have got to go home to the farmer that needs it. The man who will come to the State dairy meeting of this kind does not need dairy instruction; he is a good enough dairyman as it is. Let him be. It is up to you to encourage and carry on this work in the localities in which you are engaged, and to take an interest in the larger work of spreading this dairy instruction.

When you have gone far enough in that, I think it is well to encourage district associations where the farmer is shown the relative returns he is getting from his cows, and is encouraged in breeding better stock. Now, a suggestion as to the kind of education, that is, the quality of this education that should come out along a particular line, and that is this: With all due respect to any college men that may be here or any advocate of the pure-bred Jersey, Guernsey or Holstein cow, I want to tell you that the common cow—I don't care what she is, just so she is about seven-eights common cow—that old common cow is entitled to a whole lot more credit than the people have given her. This is not an argument for the common cow. The fact is, however, that we must not get too far away from the common cow in our efforts along dairy instruction lines. If we are going to carry this dairy instruction out to the farmers, then we have got to keep pretty close to conditions under which he is working. And when we do that we have got to deal with the common cow that is on the farm. Not being familiar with conditions here, of course, I may make some very impractical statements, but you will pardon me if I speak of the conditions as they are in the West, rather than as they are here in the East. This common cow, this much-maligned common cow, has made dairying possible in this country. She has built up our creameries, paid off the mortgage on the farm, and got comfortable bank accounts for the farmer. Now, do you blame him for not wanting to turn away from her all at once, because the college man tells him he cannot afford to go on without having blooded Jersey cows. Out in Minnesota the farmer knows who carries him through grasshopper time, and when a young fellow comes around and tells him "You are a fool to keep that old scrub cow on the farm; you ought to get some Jerseys and Guernseys," what is the conclusion that the farmer is pretty apt to come to? It is a sensible conclusion , is it not? I refer that to any breeder here. I am not putting this up as an argument against full-blooded cows; it is simply this, that our cows on our farms today are better cows than our farmers are dairymen, and we have got to educate that farmer before he can make a success of keeping full-blooded cows. Just as he progresses as a cow-keeper, then he may improve the quality of cows and make a success of keeping them. Take the average creamery patron from the country today and he has got good deal better cows than he is a dairyman. I often remember what ex-Governor Hoard, of Wisconsin, said at a dairy meeting. He said, "If the cows of this country had a voice they would be here calling for a better breed of dairymen." I think there is a whole lot of truth in that. If a man who wants to make a specialty of dairying or a man who has the disposition, the time and the conveniences to go to dairying on a larger scael, I would advise that man just as strongly to get full-blooded stock; he will then be a dairyman. But this term dairyman is an elastic one. As we apply it to farmers we are not speaking of dairymen, but men who carry on farming with dairying as a side issue. They have a few cows on the farm and keep them year after year and the Lord only knows what they do, or do not. They do not know what the cow is doing and they think they are in the dairy business. Yet, my friends, under those conditions, the cows have made dairying possible for that kind of a farmer and have built up the dairying business in a great many of our States. It simply shows what dairying will do in spite of the dairyman, and shows, too, what the dairy business can be made to do by the right kind of dairymen with the right kind of cows. With that kind of a man we should apply the instruction along dairy lines. I may advocate the Holstein, the Guernsey or the Jersey cow, provided she can be put in the right kind of hands. I do not want anybody to get the idea that I am not an advocate of the pure-bred dairy cow of any of these breeds, because, for the man who will give them the kind of care they ought to have, they are the kind of cows he ought to have. I am not naming any of those particular breeds; I leave that to the dairyman who wants to go into the business, but I do believe that for this ordinary farmer we are going out to instruct we must keep pretty close to the old cow, and not say much about Jerseys and Holsteins and these other breeds. We should, however, talk to him about improving those cows by a system of breeding,—something that is inexpensive to him in building up his herd. At the same time he is improving himself as a dairyman. He should get a good sire and improve his herd along better lines. Of course, those subjects will be handled by other speakers, and I will not go into that, but I hope I have made myself perfectly plain, and that I am just as much in favor as a man can be of this pure-bred cow in the hands of the right kind of a man. But to go out and advocate to the farmers of Pennsylvania that they shall sell off their scrub cows and common cows and get Jerseys and Holsteins in their place would be a fatal blow to this kind of education which we hope to carry on. In the first place you could not find the pure-bred cow if you wanted to. In the second place you could not get money enough in the State of Pennsylvania, rich as you are, to buy enough to go around, for they are very valuable, these better bred cows.

Speaking of the Holstein and Jersey cow reminds me of a story about an argument between a Jersey and Holstein man. The Jersey, you know, is noted for giving very rich milk, but not very much under certain conditions. The Jersey man said to the Holstein man, "My friend, do you know how I can tell whether milk comes from a Holstein cow or not?" He said, "Take a pail and milk that cow, put a half dollar at the bottom of the pail and if you can see the half dollar through the milk that milk comes from the Holstein cow." That was a pretty good one and the Holstein man said, "Do you know how I can tell whether it comes from a Jersey cow?" He said, "No." "You take that same piece of money and a pail and milk that cow and if the milk does not cover the half dollar it is a Jersey cow." And yet I believe I am quoting many of your views this afternoon when I say that the Jersey cow is the most economical producer of butter of any cow in the business. The farmers of the country, however, are not ready to handle the Jersey cow; they are not able to take care of the Jersey cow as she ought to be taken care of. As a rule farmers know how to take care of ordinary cows, know how to breed them, feed them, and take care of the milk and cream. I have had some experience with pure-bred ocws. I moved to town, went into this State work and my wife was calling for a Jersey cow. I wanted to have a good cow, of course, and I felt I know how to take care of a good cow. I was well enough acquainted with the professor at the agricultural college to get one of the cows out of the herd; I paid high for her, but I got her just the same. I took her home and she stayed three weeks with me, and all of the milk and the feed and all of the water that that cow consumed in that time, I was going to say you could put into a stiff hat. I guess you could put all the milk there to without running it over. I could not make friends with that Jersey cow. I used all the theory I had available and called into practice all of the practical experience I had, but I could not get on the right side of the Jersey cow and make her eat and give milk. The result was that I had to trade her back and get one of those old black and white Holstein cows. Then the dairy business was solved so far as I was concerned, and I got along all right. But it shows the sensitiveness of those highly bred cows, and I think the Jerseys are more peculiar in that respect than the other breeds. If the ordinary farmer takes that cow and lets her sleep in the straw shed and eat straw for her health, as a good many of them do, he has no business with that kind of a cow. Now, of course, the farmer in Pennsylvania would not do that. Your farmers are more enlightened—I am assuming a great deal perhaps—but they are not in Minnesota, and we have those conditions to contend with.

I have talked longer than I intended to, but perhaps I have opened a field for discussion here, and I am going to ask you not to expect me to punish you any longer. I thank you for the attention that you have given me. I hope that you will, through your organization, or organizations, work out some feasible plan for encouraging education along the lines that I have outlined. If I have emphasized the common cow too strongly it has simply been for the purpose of pointing out the danger that lies in approaching a farmer. Let us approach him on the ground he is standing on and then gradually work up from that standpoint. I thank you very much.

The President: We do not want to pass over this very interesting subject without some discussion. Mr. Slater will be glad to answer any questions you may see fit to ask. I would like very much to have a discussion on this subject.

Prof. Van Norman: I did not hear Mr. Slater call attention to some of the specific results that the instructors in Minnesota have brought to the creamery buttermakers in that State. I was in St. Louis and saw the wonderful record the buttermakers made down there in competition with the world. I want him to tell a litle about that.

Mr. Slater: It was modesty kept me from mentioning that.

Prof. Van Norman: About the help that the instructor is to the buttermaker?

Mr. Slater: I think I can say without fear of successful contradiction it is just this kind of instruction that has made Minnesota the reputation that it enjoys as a butter-producing State.

How many banners do we have?

Mr. ———: Six.

Mr. Slater: I did not ask the question to emphasize the number. It is not so many but that I should remember, but I was not positive whether it was six or seven. There are only two held by any other State in the Union. Illinois and New York have one each, I believe, making eight in all. Minnesota has six.

Prof. Van Norman: What are those banners?

Mr. Slater: These banners are awarded by the National Creamery Buttermakers' Association at annual conventions. At these conventions butter is exhibited from the various States of the Union. Then the highest average is taken of the butter from these different States. The highest average is one hundred, and the State that sends butter with the highest average gets the banner. Of course the intrinsic value is not especially great to the one that gets it. It is generally conceded in the West, not only in Minnesota, but throughout other States, that this result has been brought about largely through these traveling instructors. It has also been largely brought about through the co-operation of the buttermakers with the patrons in bringing good material. It is simply the rule that when you have a reputation for a product you are going to get more money for it no matter what you are selling. The farmers of Minnesota are receiving pecuniary results from the winning of these banners. They say Minnesota cows are not producing what they ought to and farmers are not getting from their cows what they should. The quality of their butter, however, has been particularly emphasized and it has been from this particular kind of instruction at the dairy schools and the different departments and by the differetn dairymen's associations. We have two dairymen's associations in Minnesota, one composed of butter and cheesemakers and the other of dairy farmers. It is that joint work between different forces that brings about these results, and has brought them about. You can do the same thing here, and in doing that keep just as far away from politics as you possibly can, because when you get politics mixed up with organization work of that kind you not only get a class of men in the work that should not be there, but you also get men who cannot work in harmony. That seems to be the outcome, anyway. Politicians have at heart their ambition more than the benefit that is to come to the industry that they are in. Of course, I am talking on a subject that you are not interested in here in Pennsylvania.

Prof. Van Norman: Mr. Slater, who pays for these instructors.

Mr. Slater: The State of Minnesota bears the expense for all of this instruction work. The dairy school is maintained as a branch of the State University, and, of course, is supported by the State. The Dairy and Food Department receives an annual appropriation of approximately $60,000 for carrying on this kind of work. They must carry on the food inspection work in connection with that, but I guess perhaps the larger proportion of it comes with dairy instruction. The State Dairy Association receives an appropriation of $2,000 a year to send men out to meetings and discuss various subjects. Then the association gives an appropriation, I think, of $600 a year, so that that work is all carried on by the State. I am happy to be able to say that the officers and the members connected with these different institutions all work in harmony, or have at least since politics was really eliminated from that work. To be serious, politics have been practically eliminated from the work. That is the reason the work is so effective at the present time. Then I have not mentioned the farmers' institutes which give an appropriation of about $30,000 a year. The institutes lay particular stress in their work upon the dairy business. Judging from the conditions that I can see and hear about here in Pennsylvania, I believe the plan for you to follow out is for this organization as dairymen to devise some concrete scheme of organizing this work and placing it in the hands of the dairy division of your agricultural college. Then secure some sort of co-operation with the Dairy and Food Department so that the Commissioner can give these instructors a little police power to exercise when they need it. This will make a very good combination so far as I can judge.

The President: Any further discussion? Mr. Slater spoke about the State of Minnesota receiving $20,000 a year from the farmers' institutes and $60,000 a year for educational work along these lines. I admit we should at least do some work. I believe we have done so much work according to the amount of money received. We have received, I know, a magnificent sum for our educational work; we have been getting $500, so I don't know that we can make similar progress along that line. I happened to be one of the committee that came before the Legislature for a small appropriation of $10,000 for that work. We did not get the money; we got the laugh. I think the State Legislature so far as appropriation goes, has been very derelict. I know very well that if we had received the amount of money which Mr. Slater has been speaking of, we would have a corps of instructors clear of politics. Until we get some one to pay the fiddler we cannot expect to have music. We reach into our pockets for our funds and the appropriation goes to some other cause. I think the dairy industry and agriculture have been seriously neglected. I think it is time we all get together and give the matter a push. This is a very important and interesting subject. I would like very much to hear from someone else. Give us your idea. It will help the ones who are trying to help you. Tell us what you think of the matter in as few words as possible.

Mr. R. J. Wells: I was very much interested in what Mr. Slater said about the improving of the dairymen at home. I went back to my father's barn a number of years ago, chuck full of this enthusiasm that the gentleman spoke about. I found it very hard work indeed to interest my neighboring dairymen in bettering their condition as I thought. I succeeded in a measure in getting some changes. I invested a little money for paraphernalia, and in that way got them interested in the matter of improvement. As Mr. Slater has said, in Northwestern Pennsylvania, the cow carried the farmers through hard times, through thick and thin, and they know she has done them good and made a profit for them. The thing that is hard for the dairymen of Pennsylvania to understand is that they themselves are the element that need more improvement than do the quadrupeds on their farm. We ourselves have got to set the example toward the improvement of the dairyman and get him interested in his improvement, and also in the improvement of the condition under which he is working and the improvement of the stock with which he works. I am satisfied from my own experience that if we could simply follow along the line of improving upon what we have by using the methods suggested by the agricultural departments at the State College, every dairyman in Pennsylvania would be benefited. It would also awaken an interest in the use of the lead pencil and the brain in finding out where we are at. A great deal of good would in this way accrue to the dairymen of Pennsylvania, I am sure.

The President: I know full well after this meeting is over you are going to break up in little groups and have a most enthusiastic talk. That is good, but why not give us all the benefit of your experience? I would like very much to hear further expressions of opinion on this same subject. Don't be afraid of any one going to hurt you; we will all be glad to hear from you.

Mr. Smith: I would just like to emphasize what our brother said about teaching the dairymen by example. I know that in my travels around over the country I have seen dairymen who were doing better work and who had better conditions in the herd than I had at home. I would go home and practice some of those things. My neighbors would come into the stable afterwards and see my herd and become dissatisfied with the conditions in their dairy and the next step would be to try and remedy those conditions. Simply by seeing what others were doing to advance brought about some reform.

The President: Prof. Van Norman will lay down the rules in reference to scoring this butter. I want to say to Mr. White that he has set a very high standard for himself this morning; he will have to come right up to the scratch if he is going to keep to the same high standard this afternoon. We are going to expect whole lot of him because we got so much more this morning than we expected.

Prof. Van Norman: Mr. President, we have no tool invented or scales for reading the quality of butter and therefore it is a matter of judgment of man, and as long as it is so there will be more or less opportunity for difference of opinion. But it has been my opinion that the only way to make these scores of real value is to get men to do the scoring who stand high as judges of butter and as men able to express their judgment on the score card, because that is the only way we have. Furthermore, the judgment we want is the judgment that represents the ordinary market estimate of the quality of butter. To give a man a score of 96 for butter that is worth only 93 because it will make him feel good does not help his butter-making ability at all. Giving a score of 89 when a man may be entitled to 90 may make him mad and if he gets real mad maybe he will become a better buttermaker. The chances are that too low a score will not hurt the industry anyway, but when we give a man a score that is too high, it is really a detriment. I may have said to this association before that when butter has been scored about two points too high it makes our buttermakers feel good and get out a good exhibit. The reason why our scores run low, in my estimation, is because our butter has been low, and when we have a high score it is because we have good butter, and I know that Mr. White is one of the five best butter judges we have in the United States. I have seen his work on and off for the last four or five years. I believe that the scores will represent the market estimate of the quality of butter. This afternoon he is going to score this butter and talk as he goes and answer questions. We are going to give him an hour or an hour and a quarter. It will be your fault if you do not get all the information he has got to give you in that amount of time. I want to say further that these tubs have come in here and Mr. White does not know whom they come from. On the tub there is simply a mark which the clerk will record. When he criticises the poorest butter, it may be your butter, if you have any here. On the other hand, if he holds up some and says this is the best piece of butter, that may be yours. I hope you may all have the best. We have tried to have a fair and impartial judgment of it and that is what we want, and I believe that is what we will get.

Now, I suppose if we would jog our scores up several points we would have one hundred instead of twelve or fifteen below. I would rather have twelve or fifteen below and have the score represent market requirements than have one hundred points, if the score were not just.

I wanted the opportunity to say this because sometimes our buttermakers who get low scores feel that perhaps there has been partiality or somebody has not had a fair show. I also have heard this criticism, that, of course, the boys from the dairy school will get the high scores. Well, maybe they do; sometimes they do. If they do it is because they have learned how to make the kind of butter that the judge believes the market wants, and we have tried to have in our dairy school the men who know how to make that kind of butter. If they succeed, that is the result. That is not the result of collusion. The same thing happens in every other State where we have schools, the boys who learn the science of butter making are the boys who get the scores. That is just. There must be some relation between know how and quality.

I thank you for the opportunity of making this explanation in regard to the impartial scoring, the ability of the judge, and the value of impartial scoring in knowing where we are at. Mr. B. D. White is engaged in creamery and dairy investigation at Washington. He was formerly one of these creamery inspectors and instructors Mr. Slater was telling you about, and he has been in the creamery business, as you have learned this morning.

MARKET REQUIREMENTS FOR CREAMERY BUTTER.

B. D. White, Dairy Division, Washington, D. C.

Professor Van Norman said that I would talk to you while I was scoring. I would like to ask him how a man can talk with his mouth full of butter. Therefore, with your permission, I will say a few words before starting on scoring.

Now, we have arrived at a very critical period in the butter business, and I believe that this time is opportune for me to express my opinion. For the past six or eight years—yes, ten years, the price of buter has been going higher and higher until we have reached the climax, and I believe that we will see a declining market. Now, there are reasons for this and I want to give you my reasons for it: In certain sections of the country, notably the Central West, the hand separator was introduced a few years ago. Instead of delivering the milk daily the farmers delivered the cream. A little later some concerns saw an opportunity to have the cream shipped by rail. I know of cream being shipped as far as 800 miles. This long shipment is the only objection to that system of making butter. On account of the scarcity of butter it was found that this poor cream, after it was made up into butter and shipped to market would sell for about the highest market price regardless of quality. Consequently this new system of making butter sprang up in that section of the country. The result was that the farmers did not ship the cream until they had a can full. It may have been one day old, two weeks, and in some instances the cream was a month old when it went to the creamery. Now, these are facts, and still the butter sold at a good price. Now, why? Because there was a shortage of butter. The result has created a tendency towards bringing this cream to central points. Not only that, but it has induced the local creamery man who formerly received nothing but absolutely sweet cream to receive cream of any age or condition. The public perhaps was satisfied; the butter concumers were perhaps satisfied with that kind of butter. If they were not satisfied at least they did not know where they could do any better, and the market, notwithstanding the fact that the butter was of a poor quality, kept rising higher and higher. During the last twelve months there has been a very rapid change. The change has been from poor butter to oleomargairne. Therefore poor butter is in direct competition with oleomargarine and I believe will sell at about the same price. As soon as the consumers purchased oleomargarine every pound of that stuff that was consumed replaced a pound of poor butter until we had a surplus of butter upon the market and today we have practically a panic. I have never seen conditions more unsettled in the butter market than they are at the present time.

Now, there is no use for us to deny those facts; we have to contend with them and what are we going to do? I see only one thing for the creamery man to do, and that is to put out a quality of butter that is not in competition with oleomargarine. That quality is good quality, and I want to tell you right here that oleomargarine will never be a competitor of good butter. Therefore, it behooves you here in the State of Pennsylvania not to fall into the rut that your brothers have in the West, but to keep up your standard and improve the quality of your butter. I feel sanguine that the conditions prevailing at the present time in the West are not going to be maintained. I feel satisfied that just as soon as the farmers in the West realize what they are up against that they are going to change their methods and bring this sweet cream to the creamery where they can convert it into sweet butter. A good quality of butter will then be made that will command a fair price.

I want to repeat again, canvass the situation and see that you make a good quality. If you do not, who is going to suffer? The consumer? No. The manufacturer? Yes, for a time he will. Who will suffer? The producer, the farmer; he is the man who is going to suffer; he will have to take less for his products. Now, it behooves the creamery men and you farmers to adopt such methods or continue such methods as will give you a good quality.

That is all that I am going to say in reference to the market conditions, except that a good quality of butter will always bring a fair pirce. When the supply of butter is extremely short, a fair or inferior quality sometimes may sell at a fair price, but as soon as the market is supplied, poor butter will not bring a good price.

I am going to score this butter and I would like to ask it as a favor of the buttermakers and creamery men to come in and take the front row of seats. I want to pass some of this butter to you so that you can examine it and see for yourselves the difference in the different samples. I believe among the number of samples we have here there will be considerable difference in quality; and I would also respectfully ask the gentlemen not to smoke, because the smoke and the aroma of butter do not mingle very well together.

The President: The creamery men will please take the front seats. We will pass the butter around as it is scored.

Mr. White: Now, gentlemen, I just want to explain about the scoring of butter. We can only score it by smelling it, looking at it, tasting of it and feeling of it. The smelling is for the purpose of getting the aroma. The tasting to get the flavor, and the looking to get the color, and the touching to determine the character of the body or grain. I should have said in connection with the tasting that you can also taste it for salt. The butter is scored on the basis of one hundred as perfection, of which forty-five points is set aside for flavor, twenty-five for body, fifteen for color, ten for salt and five for style. Now, included in this style would be the package itself and the packing of it; whether it is packed solidly or loosely; whether it is smooth or rough; whether there is enough salt—but each and all of these five points are included under style, yet it does not affect the quality of the butter. However, a nice clean, well put up package of butter will always sell better than one not well packed.

Now, as a rule, we are supposed to have the standard in our minds. The standard that I have adopted is ninety-three, because that is the quality of buter on the market which passes as "Extra." From that we work both ways. If better than that I will give it a higher score; if not so good it drops down lower. Now, that is the practice I have followed, and I presume that other butter judges do the same thing.

Now, in pulling a tryer you can determine something with reference to its body by noticing the character of the butter on the tryer. If it draws smooth, or if some butter sticks to the back of the tryer—I will have to admit that this is a poor tryer—it is pretty well corroded, and there are small rust holes in it, but I guess we will get along with it all right. You first smell the butter. If you pull a tryer from the tub and leave it exposed to the air for any length of time the aroma will evaporate. sConsequently that is the first thing to do. I will reinsert this.

(Another tryer handed to Mr. White.)

Mr. White: Yes, I would prefer this one. I will have to leave it in the butter for just a moment because it is pretty warm; it melted its way through the butter very quickly.

We used to bite out of a plug of butter. We call this a plug. The official orders, or instructions, to all of our men in the field are to discontinue that practice. We believe it is unsanitary and I hope that our Philadelphia friends will adopt the same method. I hope we may see the day when that practice may be discontinued upon all the markets.

No. 9.

Mr. White: Here is a piece of butter that has a very good aroma, the flavor is pretty good, the color is clear and of about the right shade; the salt is well dissolved, neither too high nor too low and so under those conditions what is that butter worth? Thirty-nine on flavor, the rest is perfect all the way through, 25, 15, 10 and 5. That gives it a score of 94 points, which, indeed, is very good. The only criticism I have to make is that it has a very slight wintry or cow-stable flavor, very slight indeed, so slight that it would not readily be detected. Quality of this character will sell upon any market at the present time at a good price.

After we find some of a different character, if we do, I want to pass it around so that you can have an opportunity of tasting it. If we find all the butter as good as this, I will be very agreeably surprised.

I want to say this about our scoring. We have gone into some States to score butter and we only scored once; we were never invited back, because it had been the custom in those States to have local men score the butter. They always scored it from about ninety-three to ninety-nine points. If we score it from about eighty-five to ninety-five the buttermakers are very much dissatisfied, and the State authorities think it gives them a black eye. Consequently they get some judge to score it high. Now, we have no objection to that at all, but we never score butter differently in one State than we do in another. It does not make any difference in Pennsylvania, Texas, California, or any other State, there is only one way to score butter, and that is to score it as nearly right as you know how. If the people are not satisfied with that, we cannot help it.

No. 13.

I will give this 40 straight. When I say straight the workmanship I consider is perfect. This is a very well-made piece of butter and is just a little bit cleaner than the other one, it hasn't that slight cow-stable defect. The way we start out here I would think you must have selected about a dozen of the best creameries in the State of Pennsylvania. How about that, professor?

Prof. Van Norman: We are not making any promises; we will wait until you get through. We hope they are all that way.

Mr. White: Well, now, this is a very nice piece of butter. I am not going to give you a sample yet.

Prof. Van Norman: We want something for contrast.

Mr. White: Yes, we want something that is decidedly different from those.

Prof. Van Norman: I do not think you have finished by saying that the division of the score card is 45 for flavor, 25 for body, 15 for color, 10 for salt and 5 for packing. When you say straight it simply means you give perfect on each of those points all the way down.

No. 10.

Mr. White: Here is another very good one, not much different from the rest of them. This is 39 on the flavor. There is very little difference between those three tubs of butter, very, very little, but this does not happen to come out of the same churning, because this is slightly mottled. We will give it perfection on body, half point off on color, salt is all right, and package we will not consider unless it is poorly packed or poorly finished off, because this is not the regular market package, as I understand it. Very little butter is packed in this manner except for exhibition purposes.

39, 25, 14½. I just want to draw your attention to one thing in connection with this package. The butter maker put in the paper lining and folded in over the edge like that. After the butter was packed into it and smoothed off he put the circular on before the edge was turned in. Now, that is not the right way. It is difficult for the buyer or anyone else to get the paper off and it might be torn and make a rough-looking package. It would be better to turn the liner down first and then put the paper on top. This one was put on right. If you will notice that was folded in and for a large tub it was folded in just about right.

The flavor 38 and the rest is all straight.

For criticism on flavor, I want to say this is about as clean as the rest of them, but has a distinct woody flavor which undoubtedly came from the tub, which was not properly soaked. That is especially true with the spruce tubs. If a spruce tub is not well prepared or paraffined the odor will penetrate to the center of the butter every time. Therefore, if you ship butter for inspection purposes I would advise you by all means to paraffine the inside of the cover as well as the tub, because the odor will go through. Now, this man lost at least one point or a point and a half on account of the woody flavor. I want this one to be compared with this other one here to show that woody flavor.

No. 12.

You will notice I have been eating practically all of the butter that I have taken off the tryer because it was good enough to eat. This is of a little different character. The flavor is mild, the body is a trifle pasty. I might add in connection with the flavor that it does not have that nice aroma and flavor that the others have. This shows indications of cream that was not strictly first class. But it is not bad. I would score this 38 on flavor, 24 on body, the color and salt is all right.

In body, I would say it is overworked, trifle salvy.

Still, we have not found anything startling so far as poor quality is concerned.

No. 15.

37 on flavor, body is all right, color is all right, salt is all right.

Now for the criticism. On flavor, high acid, slight cow-stable flavor.

Now, the high acid gives this a coarseness which cuts it down a point or two. As soon as you get above a certain per cent. of acidity you lose that fine, delicate flavor that you get in cream that is ripened at about fifty or fifty-five hundredths of one per cent of acidity. I believe that was ripened a little higher.

No. 14.

Still no change. 39 flavor.

I think I will have to commence to dish out some of these samples, Professor. I wish you would turn the print bottom-side up. There is some lettering on it. I don't know what it is, and I don't want to see it at all.

No. 8.

38, 24½, 15, 9½, 5.

Remarks: High acid, body a trifle loose; weak, you might call it. Salt not quite dissolved, althought it is not bad. I just want to draw the maker's attention, however, to the fact that the salt is not all dissolved.

Mr. ———: Taking it by guess, how much moisture would you suppose might be in that sample?

Mr. White: I have quit guessing, because whenever I tried to guess I was just as apt to be wrong as right, and perhaps more often wrong. Now I want to say right here, if there is a creamery in the state of Pennsylvania where the moisture test is not used you may get into trouble any day; perhaps not through winter, but more likely during the summer months.

Mr. ———: What per cent of moisture do you consider best?

Mr. White: It is very difficult to answer; it depends a good deal on the character of the butter fat. Some butter will retain more moisture than others, but we recommend moisture contents of about 14 per cent; that is 2 per cent under the standard.

The Internal Revenue Bureau provides that butter having over 16 per cent of moisture shall be classed as adulterated and the manufacturer thereof shall pay a fine of $600, and a ten-cent tax on butter so made, whether he makes one pound or more.

Mr. ———: What make of moisture test do you recommend? There are different makes on the market.

Mr. White: There are two which are largely used—one commonly called the Irish test, the other the paraffine, sometimes called Ames. The latter is the better of the two, because you do not burn the casine. If you hold butter over a direct flame you are liable to char the casine and drive off some of the volatile fat as well.

Now, you gentlemen have not had a bite of this butter. I am going to pass around some; we will put one or two blocks on. This is the one that is woody. I would like to have you take your knives and cut off a piece of both of these samples and see if you can tell any difference. The one with the highest color is the one that is a trifle woody, and yet there is not very much difference in the quality of any of those butters.

No. 1.

36 on flavor, the rest is all straight. I am going to wait just a few minutes to give you an opportunity to taste this sample of butter before I give you a criticism. I will again lay the last one at right angles with the other. Now I would like to get up a little discussion on those three samples. I would like to get an expression on the last one; I did not announce the criticism on that. It is not bad at all, but there is a defect there; let us have the opinion of any one.

Prof. Van Norman: Call names if they don't talk up.

Mr. ———: I can't tell any difference.

Mr. ———: There is one that has a barn flavor.

Mr. White: That last one has what I term a feverish cow-odor. One or more of the cows from which the milk came is in a feverish condition. I might explain that by the use of a homely phrase—it smell's like a cow's breath. It is not bad, but we took the first one we have had so far.

No. 3.

36, 23; the rest is all right.

Criticism: On the rancid order. I have no doubt in my mind but that this butter will get rancid inside of a few days. It is slightly rancid at the present time, due to the fact that it is over-worked. Over-worked butter will go rancid and fishy very quickly. Now, this is salvy, greasy, and decidedly overworked. It is also very light in salt. This would stand one more per cent of salt. I believe the consumer would take it just as quickly and not say anything about it, possibly would prefer it to have more salt. Therefore the creamery that makes that butter will lose one per cent on account of light salt. You can figure out what that will mean in your business. Every ounce of salt that you add to your butter will increase the weight that much. Therefore, if you make butter that lacks in salt you will lose in weight. I do not believe in over-salting. Don't understand me to advocate extremely high salt, because we are having a very hard time to get some of the creameries to put in the right amount of salt. The tendency is to put in a large amount. A great deal of butter that goes on the market now contains between four and five per cent of salt. I dare say that that butter does not contain two per cent. I believe it contains less than two per cent of salt, and the maker certainly is losing.

No. 4.

36, 25, 15, 9½, 5.

Criticism: Coarse flavor and oily. Undissolved salt. I will give you my candid opinion with regard to the oily flavor of this butter. I believe the butter maker used rancid butter coloring. It tastes very much like it. Butter coloring should be kept in a dark, cool place. The oils from which it is made become rancid in hot weather in comparatively a few days. I believe that the coloring used in this butter was old and became rancid, and therefore it imparts that oily flavor. You want to try a sample of that. We will just pass this around hurriedly; that is the butter with the oily flavor, a trifle light in color and containing undissolved salt.

No. 2.

This is the first objectionable piece of butter I have found today. Some of the other had slight defects, but this is objectionable. This is made from stale cream. I am willing to stand back of that, no matter whether the cream was stale when it arrived at the creamery or whether it was made stale in the creamery. It is not a good piece of butter at all. It is 35—one off on body—and the rest is all right. Just mark that "Stale cream and over-worked."

We will pass this plate around; you can take your knife and taste a bit of that; possibly you can smell the bad aroma from the cream.

No. 5.

35, 24. Color is all right, but the salt is too high and undissolved, 9.

Criticism: Flavor very oily and body weak, salt too high and undissolved. Now, that too I believe is made by the use of stale coloring.

Mr. ———: To what do you attribute that oily flavor?

Mr. White: Stale coloring. Very likely that is the cause.

No. 6.

38, 24½, 15, 9. 5.

Criticism: High salt, the color is good, flavor good, but the body was over-worked. There are some good qualities in this butter, but it is covered up with high salt so that you get only the salt flavor.

No. 7.

Here is a sample like the first ones. We get 40 straight. It is a nice piece of butter. That is the only criticism I have.

Prof. Van Norman hands piece of oleomargarine to Mr. White.

Mr. White: Now, Professor, I have always refused, absolutely refused, to score butter that had any marks on it. This has a mark on it and I refuse to score it.

Prof. Van Norman: The law requires it to be marked and I could not help it.

Mr. White: If you would have taken that off and turned it bottom side up I might have thought it was sweet or unsalted and uncolored butter, but this little capsulea gave it away.

Now, this is a pound of oleomargarine with which goes a little capsule of coloring matter. The good housewise is supposed to take this pound of oleo, put it into a butter bowl or other dish, break the capsule and work the coloring into the oleomargarine.

You can realize that after such an operation, such a process, it would be a greasy mass. There is the coloring; you can see it. Now, if you want to taste that you can; I do not care to particularly. Now, I am sincere when I say this: oleomargarine is objectionable to me because of that raw cotton seed flavor; this exceedingly oily, natural flavor, which does not seem to agree with me. I cannot score more than about a half dozen samples of oleomargarine until I give it up. Therefore, I do not believe I will try this only to see what kind of stuff it is. There is nothing bad to the aroma; there is no aroma to it; nothing particularly bad to the taste, only it is soft and greasy.

Mr. ———: How does oleomargarine compare with good creamery butter in the line of food value?

Prof. Van Norman: Some of you are interested in this oleomargarine; pass it around.

Mr. White: If you will just give me your attention I will answer the question; it is a very important question. The gentleman asks how the food value of the oleomargarine compares with good creamery butter. So far as actual food value of any butter is concerned, it does not amount to a great deal. We do not buy butter for its food value. We buy milk and other atricles of food, but butter is really a delicacy and we pay for the aroma and flavor of the butter. Therefore some butter is worth ten or fifteen cents a pound more than others. If it were merely for the food value the poorest pound of butter that you can make may be as valuable a food or may contain as much food value as the best pound of butter. So I do not think that is a matter to take into consideration, because neither butter nor oleomargarine has been considered of any food value that you can speak of.

If there are any questions, I believe we have scored all of this.

Mr. ———: How is the milkman to preserve coloring so that you will not get the effect you have had in the samples this afternoon? He goes to the grocery store; the clerk may have it on the shelf for months. If he buys in large packages, can he keep it so that it will not develop the cause of that trouble?

Mr. White: Not very well. I believe the best thing a dairy man could do if he lived somewhere near the creamery man is to prevail on the creamery man to buy a small quantity of coloring.

Prof. Van Norman: How frequently is it necessary to get a fresh supply?

Mr. White: I believe you can keep coloring perhaps six months, if kept in proper condition, longer in the winter time. I do not believe there would be very much deterioration during the winter months, if it could be kept cool, although it don't want to freeze. In the summer season it might keep for several months provided that it is well corked so that the air does not get to it.

Mr. ———: If a person buys a package can he take out a small quantity from time to time and put back the cap without having what is left deteriorate?

Mr. White: Yes. You had better buy in small quantities, not over three to six months' supply at a time. I believe that would be safe.

I have been taking up a good deal of your time; I want to make a few remarks in regard to the general quality of this butter. I do not believe in flattering any one, but I want to say this—that it is very seldom that we find this number of packages of butter if such high quality. Now I am pleased to say that. I would be pleased to say it anywhere whenever possible. I can say that you have some very fine butter here, considering the time of the year in which it is made. Now, I don't know, Professor, whether we are to score off any ties or not; how about that?

The President: No ties.

Mr. White: If there are no questions we will quit the job; if there are, I will be glad to answer them if I can. If I cannot, I will be glad to say so.

The President: Are there any further questions you would like to ask Mr. White?

Mr. ———: What causes fishy butter while in the refrigerator, and how can we avoid it?

Mr. White: I cannot tell you, because we do not know what causes fishy flavor. I can tell you how to obviate it though, if that will do you any good. The Department has been carrying on experiments for some five years in churning sweet, pasteurized cream without the use of starter or without the use of any acidity whatsoever. All of the Navy's butter is now made by this process. The butter that the Navy uses is sometimes two years old before it is consumed. There is no known process that will give satisfaction besides churning sweet, pasteurized cream without the use of a starter or without ripening. I will go on a little bit further in connection with that. The milk or cream as it is received is separated and pasteurized and cooled down usually to a temperature of about forty to forty-five degrees, depending on the character of the milk and the time of the year. It is held until the next morning, when it is churned. The churning temperature may be all the way from forty-two to fifty degrees. Butter made in that way has excellent qualities and does not develop either a storage or a fishy flavor, but will remain sweet and without any change in it for a year or a year and a half.

Mr. ———: Do you make just as exhaustive churning?

Mr. White: Provided you hold it over night. We used to advocate churning the same day, and we got into trouble because in some cases where it was churned the same day the loss in the buttermilk was too great. Therefore, the creameries are now holding that cream until the next morning. Remember this, however, you must churn this sweet cream at a lower temperature than ordinary cream. Take from an hour to an hour and a half to churn it in order to get exhaustive churning and good butter.

The President: Any more questions to ask Mr. White? This is a very interesting subject, and I would like very much to have a few ideas crop out of this discussion. Are there any questions at all that enter your mind that you would like to have Mr. White answer? I know it would be a pleasure for him to do so.

Mr. ———: I would like to ask Mr. White the conditions that affect that moisture problem in butter? What conditions lead to extensive moisture condition in butter?

Mr. White: In a majority of cases, high churning temperature causes high moisture. If you reduce the churning temperature so that the butter will become firm, I do not beileve you will have any trouble.

The President: Anything further? Lots of room for discussion.

I would state, Mr. White, that you can come back to Pennsylvania again. I don't think there can be any objection as to the scoring here. There is one thing I noticed that you did not think about, and that is, that this is our thirteenth meeting and No. 13 sample had the 95 score. Remember that; I think 13 will be a good number for you.

Mr. White: Good; I thank you.

Prof. Van Norman: Possibly Prof. Larson will tell you about the educational scoring contest carried on at State College.

Prof. Larson: We have been conducting tests of this kind for the last few years, but last year we put on a new plan and had four contests. We used to have it every three months during the year. We had it divided into four tests. The plan of this test was to have butter makers send five pounds of butter. We sent out the tubs, paid the express on it and paid the express on the full tub when it came back. We sold the butter after it was scored and just about came out even on the sale of it. This butter was scored by one of the judges on the market. Mr. White scored several times, Mr. Friehofer, Mr. McAdam, and different judges. This butter besides being scored was analyzed and comments sent out to each butter maker who took part. Besides that, the Department made comments and suggestions as to the method of improving the butter. Everyone who got an average of ninety-one and no score below ninety received a diploma or certificate.

This same contest will be continued this coming season. If anyone wishes to take part he can do so by simply writing to the Department. Many think they have been greatly benefited by the test and a great many write they would like to have it continued. There is always an opportunity to ask questions; we send the butter maker a blank which he fills out and returns. This blank is always answered by someone in the Department. We keep a record of the over run and figure the over run on each churning. We require the amount of cream used in making the butter to be stated, and the amount of butter made. We then make suggestions as to the over run. I call 18 and 19 per cent. a good over run.

I would like to ask Mr. White while he is here to answer a question that is very often asked of us, and we answer it in our way. I would like to hear him express himself on it. He stated this forenoon that in the whole milk plan you do not get as much over run as in the gathered cream plan. Many butter makers have heard it and some of the farmers want to know why they should not be paid more for cream than milk?

Mr. White: As a general rule, milk that is delivered to the creamery produces a better quality of butter than cream. That more than offsets the difference in the overrun; therefore, I do not believe it would be advisable to make a difference in the price between the milk and the cream received.

Now, you may have some other reasons for that; that is one and it is a valid reason. As soon as the farmer buys a hand separator and delivers the cream to the creamery he seems to have trouble. Now, there isn't any real excuse for it, if the cream is properly cared for. It is too often true, perhaps, ninety-nine cases out of one hundred, that the hand separator is not washed every time it is used. Therefore, if a farmer should skim the night's milk with the cream separator and then skim the morning milk with a dirty separator there will be trouble and I dare say that is the cause too often. In fact, so far as we have been able to find out most of them do that very same thing. Such cream delivered to the creamery will make an inferior quality of butter to that made from whole milk. I believe that is reason enough why they are not paid any more for it.

The President: I will announce the following committees. We would like to have a report from these committees on Friday morning:

Auditing Committee: Messrs. Harrington and Knight.

Resolutions: Prof. Larson, H. W. Wolman, Mr. Hall, W. R. Perham, R. J. Weld.

Nominating Committee: C. P. Van Dyke, S. B. Henson, E. S. Minor, Jacob Hershey, S. S. Yost.

I would like to have those reports on Friday morning.

The officers to be nominated are President, Vice President, Secretary, Treasurer and six Directors.

I would also like to state that at the close of this meeting there will be a good roads meeting in the Board of Trade rooms. The Governor will be present, as well as the Supervisor of the Pennsylvania Railroad Company.

The banquet will take place at 8:30. The tickets, which are $1.00 each, can be secured from Mr. Norton. Right over here is our Secretary to receive dues. Reports of the last meeting of the Dairy Union are on the table.

We meet tomorrow morning at 9:30; have a joint meeting with the Live Stock Breeders' Association. The meeting will be held in the Chestnut Street Hall.

Friday Morning, January 27, 1911.

H. L. Stokes, President of the Dairy Union, in the Chair.

The Chairman: You will please come to order. The first thing on the program for this morning is a symposium on the "Cost of Milk Production." The subject is to be opened by Mr. W. H. Palmer, of Kingsley, Pa. Is Mr. Palmer present? He does not appear to be. We will proceed with the next speaker on this topic, Mr. A. B. Huey, of Lenapa, Pa.

COST OF MILK PRODUCTION

A. B. Huey, Lenape, Pa.

Being asked to say something to you on the cost of milk production, I will first quote from the Thirteenth Annual Report of the New Jersey State Agricultural Experiment Station, New Brunswick, New Jersey, for **the year 1909.**

Their cost for maintenance would be practically the same as ours, their cost of milk in cans at the farm is .0416 cents per quart. This is for actual cost of feed consumed and labor expended. It does not include anything for supervision, investment in the farm itself, dairy buildings, neither apparatus, milk utensils, incidental expenses, or insurance, and with cows averaging 8,561 pounds of milk per year.

I will consider this cost of milk production as that of the average farmer who raises the greater part of his own feed, and markets it through the cow. What can he do to cheapen the cost? In many instances where he has made a competency, he has done it either through more than ordinary judgment, or the strictest economy and hard work, often drudgery.

This reminds me of an instance where a farmer had bought a few cords of wood from a neighbor. When the farmer came to settle he mentioned the fact that in coming out with the last load two or three sticks had fallen off, and as he had on a heavy load he did not get off to recover them. He would therefore just take five cents off the bill. This man did not make that five cents, he only saved it, and so many milk producers are doing just as this man, only saving by the closest economy, which in most instances either is taken out of himself or some of his family. While I think it is often as important to learn how to save money as to know how to make it, I do not like to see the line too closely drawn, and I think that every producer when he comes to figure out for himself whether he is making any profit in the production of milk should take into consideration this labor account.

Having decided to go into this dairy business, one of the first things to consider it, how can I keep this cow profitably? How can I handle her milk satisfactorily, and how can I know a profitable cow? What shall I raise, and how can I handle it at the least possible expense?

Before buying the dairy herd, build yourself a silo, preferably of stone. Some kinds of silos are better than others, but any one is better than none. Not that more milk can be made with silage than with concentrated foods, but it can be made at less expense. Prepare yourself with a crop of any variety of corn, whatever will raise the most corn per acre in your locality, and do not make the mistake of so many and raise your corn too thick. I think it is clearly demonstrated that corn will not do well in the shade of a tree, and just in such proportion will it not grow in the shade of itself. Good corn, well eared, fully glazed and husks commencing to dry, just in proper condition for silage, will be one-third total weight of ear alone. How can we expect a fodder to take the place of feeding value of ear? Actual weights carried thorugh a series of years and with different kinds of corn have always shown the fodder in weight, not bulk, to equal or exceed that planted thicker, and always an excess of grain.

Do not be afraid of the stalk or ear being too large, as you can prepare yourself with a cutter that will handle them. Cut this corn as low to the ground as possible, thus doing away with any long stubble in seeding, and loss of valuable feeding matter in stalk. In the handling of corn from field to silo, many farmers add unnecessary expense, first by not having low-down wagons to haul this corn out, and second by carrying it or turning it half around to get it upon the cutter. At the end of the elevator or blower pipe, always have a hopper with a funnel hanging to it, and made in sections to injoint as you go up, to carry corn from hopper to bottom of silo. This always insures an even distribution of your corn, avoiding all mould spots, caused in many instances by throwing bunches of leaves in one place, as is open the case in leveling with a fork. This shute always saves one man, as the person who carries it can both distribute evenly and tramp at the same time. I always advise the ramming of silage as getting it denser, thus avoiding all air spaces possible. Silage may be spoiled by leaving too much air in the corn in filling as well as from outside air. Just here I will say that a poor silo properly filled is better than the best stone one carelessly filled. Good silage should always be cold after the first heating has gone, as this second heating is the first stage of decay and should never be found when the work is properly done. Corn fodder can readily be kept in silo when properly wet and rammed. There has been quite a lot of experimenting in order to find something with more protein in it than corn, that is adapted to silage purposes, but all things considered I know of nothing so satisfactory as corn.

A great many are returning to alfalfa for protein, and justly. I must advise you to try alfalfa, since in many sections of the state alfalfa seems indigenous, and there is little or no trouble in raising it.

I suggest from my experience and observation that you can raise it anywhere if you will carry out the following: I prefer fall sowing, by this I mean August. Not that the alfalfa will germinate better, but on account of weeds smothering it out in the spring.

Have your ground deeply ploughed, with no vegitation to harrow up. Spread thirty-five to forty bushels of lime per acre or 1,000 pounds of ground limestone and 10 loads of well rotted manure pe racre on this ploughed ground before cultivation for seeding. This manure makes a mulch for seed germination which in no instance should be negelcted. I believe in inoculation where it is needed, and you can tell by the light, sickly color of the plant if such is the case. The proper way to secure inoculation is to plough up this some piece of ground each fall after second cutting until you have it.

Perhaps you have ground adapted and merely need a better stand. This can possibly be as well obtained by harrowing the ground deep after second cuting and reseeding. You need not be afraid of harrowing up the alfalfa or of covering it with dirt. I have seen a better stand apparently from the sprouting of the roots where the ground was ploughed than before the polughing was done. In my section we have as yet used the hay cap, but to a limited extent. For the first cutting this is a necessity. The alfalfa, where clear of weeds, may be put in small hand stacks with little or no wilting. These stacks every other day should be moved by two persons upon opposite sides, slipping them sidewise to fresh stubble. You need not be afraid of even the thinnest muslin hay crops, as they will turn the most severe weather and are no experiment. With an abundance of good corn silage and alfalfa hay you are as well prepared as you can possibly expect to be to keep the cost of milk production low as far as maintenance is concerned. What I have said in regard to alfalfa is equally applicable with our red clover, which makes a very good feed, and it or alfalfa is almost indispensable. While I have never done any soiling with alfalfa, some think it has no equal for that purpose. Both with alfalfa and red clover the most common practice is to let them get too old before cutting, a mistake which should be avoided.

Barns need not be expensive structures to insure health to the cows, but plenty of light with good ventilation is always essential. Where you are remodeling any barn it is a mistake not to prepare for ventilation. Do not place in the stable a lot of wooden stalls, which will never score high. Sanitary inspection is sure to come, so build with this object in view, and do not fret if you have been so short-sighted as not to meet its requirements. Stanchions I have no use for farther than it is possibly the cleanest tie known, nevertheless I would discard them on account of their being too confining for the very best results.

A gutter behind the cows or a platform upon which the cow stands is advisable. As I always think an ounce of prevention is better than a pound of cure, in no way neglect the clipping of the hair from the thighs, flank and sides of the cow in fall before stabling. This is a precaution in cleanliness not to be neglected.

The matter of something to wear both for the protection of your own clothing and from a sanitary standpoint is a perplexing one, and naturally to the initiated suggest white. Yes, white suits to milk in. That reminds me of what happened once when I went to inspect some dairies supposedly expected to wear white. In going through the barn I espied a nice closet with doors standing open. I suppose I looked rather closely at it as I

passed, as the information was volunteered, that is the closet where we keep the suits, but they are at the house being washed. Friday noon, rather a peculiar time, unless washed every day, which was hardly likely. Another pause, when he said, to tell the truth, it is too damned hot to wear them. I admired this truthful statement. I have never seen anything more satisfactory than a bib apron similar to a cobbler's. It is made with a plait in the bib so that from the vent down it will lap about two inches and come below the knees. Always avoid loud talking or noise calculated to make excitement in handling cows.

For the ordinary dairy no manner of starining milk is quite as efficient as to have the common wire strainer bucket into which to pour the milk from the milking pail. This strainer removes any foreign substances which may have got into the milk. This bucket should be rinsed often when needed. I would strain from this bucket into a second wire strainer covered with two thicknesses of cheese cloth, and after cooling, pass the milk through a square of ordinary grade of canton flannel. I heard before this body last year the use of straining cloths the second time condemned as unsanitary, because not likely to be washed clean. There are so many other things besides strainer cloths requiring cleanliness that where a person cannot wash a cloth, I would condemn him as not fit to have charge of the cleaning of any of the dairv utensils. Some people cannot see dirt.

A milk cooler is an absolute necessity, and in nine cases out of ten is bought too small to get the best results. Philadelphia has just announced the requirement of a temperature standard of 60 degrees Fahrenehit, with a possibility that in a short time this temperature will go even lower. This will result in all small towns requiring milk to be cooled to a corresponding temperature. To meet these requirements successfully it is going to be a necessity to use ice. Preferably an ice and milk house combined. Undoubtedly the ideal situation for a barn or stable is a southern and western exposure, and one should never build anything on these sides to obstruct the sunlight. Our prevailing winds here are westerly, so we should whenever possible go to northwest corner of the barn for a milk house, and if you have this northern exposure, the milk house need not necessarily be taken far from the barn. Your ice house only for the convenience of the vault need not be near the milk house. Where you have the combination of the two together it makes the ideal way of taking care of milk that will meet all requirements, and with the minimum of expense. Your ice house should be built with a vault under it large enough to accommodate what milk you produce. On top of this vault should be a system of pipes with the ice resting on them. Two essentials are necessary—a supply of cold water on hand to run through the pipes and the pipes so arranged that the ice will not arch.

With such an arrangement you can be reasonably sure of drawing water at 36 degrees and cooling milk to 40 degrees. The temperature of the vault in which to place the milk until shipment should not be higher than 42 degrees Fahrenheit.

Some years ago the Dairy Division at Washington sent a man to make inspection and report upon a prominent creamery firm, as to why they were enabled to get more than an ordinary price for their butter. The report said that the superiority of this butter depended to a large extent upon the ability of the firm to find buyers to buy it. In my own observation there were two other reasons: Its absolute uniformity in texture and its splendid keeping qualities. These were in no small measure due to the care and cleanliness in its production, and the attractive manner in which it was always packed.

Can we educate ourselves to judge a profitable cow? Yes, to some extent, but we older ones will have to turn our education in another direction and make a positive record of her production before we can expect to succeed. I find many instances where even daily tabulation of milk production is made and the owner does not find time to make out the yearly production of any of his cows, with their butter, fat and feed records, without keeping an actual record of same, is under a delusion, and might as well try to keep in his head the account of the money paid his hired help. This work is a positive necessity, and if one does not find time to do it himself, he should turn to a cow testing association, by which in the majority of cases it can be done more accurately and cheaply than by the farmer himself who has a variety of other interests to look after.

Is not the fact significant that where Wisconsin with 998,000 cows has twelve cow-testing associations, Pennsylvania with 943,000 cows has but two?

Michigan with 563,000 cows—six cow-testing associations.

Maine with 173,000 cows—seven cow-testing associations.

Vermont with 107,000 cows—nine cow-testing associations.

I take notice that outisde of the corn belt they have been compelled to look for things to cheapen the cost of milk production, and naturally turn to the silo and dairy testing.

Just in the same proportion as the cost of this milk depends upon the little things that have to be done every day, so does the yearly record depend to as large an extent upon the persistency of a cow milking, as upon her to giving a large amount at the time she fershens.

The yield per cow must not be guessed at. The average per cow, census of 1900, for Pennsylvania is 5,160 pounds per year. Generally speaking, the cost per quart of milk increases as the amount produced decreases. In other words, a cow giving 10,000 pounds of milk per year will produce milk cheaper quart per quart than a cow giving 5,000 pounds.

In any case, low producing cows are expensive milk makers, and must be ousted from dairies where profits are made.

Successful dairying depends upon the quality· upon the ability of the dairyman to grow on his own farm the bulk of the feed consumed and upon the application of business principles to the industry.

The chairman: After this subject is thoroughly discussed by all the parties on the program we will then ask for questions, but not until that time.

Is Mr. Palmer present now? He was not present when first called. He does not appear to be, so we will call on the next gentleman on the program, Mr. George Abbott, of Philadelphia.

Prof. Van Norman: Mr. Abbott is in the South, but he has sent his paper to be read and I will read it.

Let me say that in making up that program the idea was to have a discussion. We hoped that we would have some figures on this subject, but Mr. Huey has very skillfully avoided giving any figures as to cost. Of course, it was not expected that the milk dealer would do much on this side, and Mr. Abbott has not. We had another dealer on the program, two milk dealers and two producers, and the hope was that would bring out something of interest along this line in figures. So it will be up to the folks here to furnish the figures. I will now read you Mr. Abbott's paper.

COST OF MILK PRODUCTION

George Abbott, Philadelphia, Pa.

My first-hand contact with the production of market milk ceased nearly forty years ago, but my relation to the subject from the standpoint of the retail dealer has continued, and has afforded ample opportunity for observation.

In the field of butter making, the buying of milk by the fat content, and upon market quotations, effectually disposes of all questions as to values, for the law of supply and demand is inexorable. Not so with market milk, and we suppose that it is this that is now primarily under consideration.

The failure of the corn crop throughout the United States in the year 1907 greatly accentuated the already steadily ascending price of all animal products, based as they are upon the cost of feed stuffs. Beef, mutton, pork, butter and cheese advanced in price by leaps and bounds. In Boston, New York, Baltimore, Washington and Pittsburgh, the price of milk advanced somewhat in sympathy with those conditions. This advance was as natural as the law of gravitation, and Philadelphia would have participated therein had natural law and sequence held. But there has been no advance in the retail price of milk in Philadelphia; it is furnished the consumer at the same price as it was eight years ago, and it is furnished below cost. As a result of this condition, the producer of market milk in Eastern Pennsylvania is selling his product at an unreasonably low price. Speaking roundly, the advance in the price of feed stuffs has been from 25 to 50 per cent, and the advance to the consumer in the animal products above recited, except milk, has been about 25 per cent, and in the case of milk in all cities but Philadelphia about 12.5 per cent.

As a general statement, milk has advanced from eight cents per quart retail to nine cents per quart in the cities of the East, excepting Philadelphia. The dairy farmers supplying these cities are receiving about all of this advance of one cent per quart.

The retail milk firm with which I am connected has for many years kept books in a way that gives close tabs on the cost of distributing milk, and the margin of profit in its sale. We have found this margin to be from a quarter to a half a cent per quart. The milk dealers of Philadelphia have for three and one-half years past paid the dairy farmer about one-half cent per quart more for milk than in the previous years, thus consuming all our margin of profit.

Besides thus giving up his margin in the business to the dairy farmer, the retail dealer has been and today is confronted with a constantly growing demand for large expenditure for the hygienic handling of the milk. Thus the dairy farmer supplying Philadelphia with milk is receiving a half cent per quart less than the suppliers of the other cities of the East, and the Philadelphia milk dealer is being ground to powder beneath the upper and the nether millstone set by these trade conditions.

No sensible person will claim that this is a reasonable state of affairs, and no honest consumer, believing in fair play between man and man, will take satisfaction in the one cent per day that each family is saving at such unbearable cost to those who supply them this common necessity of life.

But the general public is unreasonable. The average man is selfish and unfair. He will boast of the price paid for an oil painting, an automobile or a phonograph, and at the same time boast of the low price at which he has secured his transportation, coal, bread or milk—the common necessities of life.

The Philadelphia newspapers are largely time serving, bidding for popularity, and the temptation to take sides with the unreasonable and selfish portion of the community has proved to them irresistible.

For twenty years past, different newspapers of Philadelphia have from time to time made attacks upon the purity and excellence of the city's milk supply, and to this in measure we believe is due the fact that the use of milk is so small—only a half-pint per capita.

No one claims that the general supply is perfect, neither that it is as good as it should be, but had a spirit of fairness or an honest wish to improve conditions prompted these attacks, there would have been encouragements for efforts towards that end. But the slogan has ever been, "Down with the price!" "Down with the milk dealer!" And this although great pains have been taken to convince them that milk is no exception to the general rule, and that a fair price must be paid for a good product. When, in 1907, a prominent Philadelphia daily unscrupulously and virulently attacked the milk trade to prevent a just and equitable rise in price, unfortunately the Milk Shippers' Union was officered by narrow-minded, vindictive men who entered into a conspiracy with this prominent daily, and for two years opposed every effort to raise the price of milk at retail.

Under such an attack it was but natural that a large portion of the consuming public was aroused and quickened, and a state of mind engendered that would wreak vengeance upon any dealer who ventured to ask an increased price for milk.

Meanwhile, Philadelphia's Department of Public Health is feeling the pressure of the nation-wide movement for a more hygienic milk supply, but they cannot apply the requirements in force in cities where a reasonable price is paid, for fear of precipitating a milk famine. Dairymen will not bestow the expense and care requisite for the production of hygienic milk when they can just as readily drive to the door of the butter factory and receive as much for the product, and no questions be asked.

What is the remedy for this unreasonable and discouraging condition? It takes months to build a good barn and to fill it with the products of the farm, but the fool or the vicious can burn it in an hour. The damage to the milk trade is great and it will be hard to repair. The regeneration of those responsible for its undoing seems the first step for relief. The Milk Shippers' Union seems to have recovered in measure its sanity, and there is a light breaking, as of dawn, in the mental horizon with the benighted newspapers.

The Chairman: The next speaker will be Mr. Fred Stone, President of the Abington Milk Co., Scranton, Pa.

Mr. Van Norman: He wrote me that he was sick and unable to be present. Therefore, he had not prepared any paper.

The Chairman: Is Mr. Palmer in the room? Have you heard anything from Mr. Palmer?

Prof. Van Norman: Nothing.

The Chairman: Any further discussion or questions to be asked? It seems the other two speakers are not here. We will therefore go on with the discussion of the question. This is an important subject and I think there ought certainly to be some questions asked. Mr. Huey, I know, will be glad to answer. He is here ready to champion his cause.

Prof. Van Norman: I would like to ask Mr. Huey what are the important factors that go to make up the difference between profit and loss in the production of milk?

Mr. Huey: I am rather afraid you have me at a disadvantage today, coming up here to answer the questions of a professor of the State College; but as I tried to outline in my paper, one of the important factors in the cost of milk production is to keep your cow cheaply. I quoted figures from the New Jersey Experiment Station. In Pennsylvania we have all the advantages that they have, silage and alfalfa, but when you count the cost of labor against the cow you would not produce milk any cheaper in the greater portion of the State of Pennsylvania than in New Jersey. Probably the cost and the amount yielded per cow will be about the same as New Brunswick, N. J. In southeastern Pennsylvania, where we have a section, which is adapted to corn and a climate which is more favorable to dairying than many other sections of the state, we can no doubt produce milk at a less cost per quart, if we have the cows that are adapted to milk production. As an illustration, I see that at the New Jersey State College their cost for the amount of corn silage for the year was about $9.00 per acre per year. This present year I made a test on corn silage and the cost was about $9.20 per acre. It costs no more to raise twenty tons per acre than ten tons, and the same is true with alfalfa. I do not have the figures but I know there is no two of us producing milk at the same cost. Some of us may have the advantage of better cows and better judgment in their selection than others; and some of us are able in the section of the country in which we are located to produce the food at a less cost than others. Now, of course, we can go on and mention other things, but I haven't any special questions.

Mr. Perham: Tell us what your milk costs you as compared with New Brunswick?

Mr. Huey: I cannot. We just started this cow testing association. We have been in it personally for a little over a year and I was very much surprised to find that in my individual dairy, where I raised the cows, they ran from 3,000 to 9,000 pounds a year. Some that I thought would yield from 7,000 to 8,000 went down to 4,000, because the milking period was too short. You will be surprised that those you think the best cows may be among your poorest.

A Member: How is the best way of getting the cows—raising or buying, as most farmers do?

Mr. Huey: Well, now, there are many things enter into that, and one of them is intelligence. You had before you last year a man with superior ability in feeding cows, Mr. Edkins, and while I am not going to be a judge of the ideals of that man, he had the ability to select cows and the ability to care for them. I say it is almost impossible to set a standard which will fit every man producing milk. Where you have a man with a market for high-class milk and one who is producing such milk, you will find that his manner of feeding is such that it would not pay that man to raise cows. But the ordinary man with no judgment in the selection of cows,—I would in all cases advise him to belong to a cow-testing association or else buy a good pure-bred dairy bull and start with the best cows he can secure. He will then be sure of getting cows that will milk a longer period and give more milk. A great many of us who feed cows think we know more than any other man. I have been raising the great majority of my own cows for the last twelve years. Personally, I think it is better to raise your own every time. You will breed stock which is better adapted to this section and which you will take pride in, and that is the best stock for you to select.

R. J. Balderson: This last year we had five two-year-old heifers in the herd. We also bought a bunch of cattle, many grade Guernseys, the best we could get at the time. They were springers, not yet in profit, so we got them on an average of $65.00 apiece. The heifers at the present time are averaging a little longer period than the fresh cows and as I averaged it up the other evening they are giving one pound of milk more than the other cows. If you ask whether it pays to raise stock, this is our experience.

A Member: What do you figure it cost to raise those heifers?

Mr. Balderson: That is something I have no data on. It may cost more than $65.00 to raise to two years old, but you have two years' more use of them than the four-year-olds and you have to charge that up against the latter.

I wish Mr. Huey would give us some figures on the cow-testing association.

Mr. Huey: Our cow-testing association has not been in operation a year until June. I have no figures available from it.

Mr. Balderson: For last month?

Mr. Huey: I did not bring any figures for last month.

Mr. Seely: I would like to know if there is any place where they make a business of raising dairy cows to sell? Up in our neighborhood when a man has a cow to sell he wants to sell the poorest one, and he is in better condition to judge the best and poorest, so when we go to market we are confronted with the poorest proposition in the herd. Now, here is the breeding business: I believe there are sections where they are breeding especially for the market. There you can go and they will offer you the best they have got. I don't believe that is all because of the dairy business. I don't know of any more pleasant business. If there is, we will be pleased to hear. I have known these Wisconisn fellows to come down here and take two carloads of cows or more out to Wisconsin, grade Guernsey cows.

Mr. Wampole: Will you give us the average of the cows per day for feed?

Mr. Huey: In a general way, yes, sir; by figures, no. We feed at the present time about 35 pounds corn silage, 7 pounds clover hay, 1 pound of grain to three pounds of milk. That is a balanced ration. Of course, some cows are consuming more feed than others, according to the amount of milk given.

Mr. Wampole: Do you get any results by reducing or increasing your feed, especially in lactation?

Mr. Huey: There is no doubt you can increase your cost of milk and at the same time increase your amount produced. Now that is clearly demonstrated by Mr. Edkin's method last year. After the meeting last year we took up 12 cows and put on test. We increased the butter fat, we increased the amount of milk and we increased the flesh on the back. Now we are selling milk by the quart and we did not get the advantage of anything but the extra amount of milk. If we had had the advantage of the extra amount of milk, the extra amount of flesh and the extra amount of butter fat produced it would pay; but where we had but one against the increased ration it did not pay. Mr. Elkins was producing milk and changed about 75 per cent a year in the cows. He was getting the advantage of the beef and the amount of milk with the amount of butter. Of course, in this instance it would pay. But there is a certain limit beyond which we can be reasonably cautious. There is a certain limit to stop or we have no advantage but the amount of milk which we increase in the cow. I believe in feeding the cows the same the year round. That was formerly my method of carrying on the dairy business: whether fresh or dry she got the same amount of feed and she took on flesh when dry and took it off when milking, and I have considered that a cow in that condition if she was milking, she would possibly milk the flesh off again and that is the kind of cow we fed on that kind of ration which Mr. Edkins fed at Westtown.

A Member: Did I understand you to say you fed the cow the same amount of grain throughout the year, in pounds?

Mr. Huey: Yes, sir; that was formerly my method and that is the way the cows were fed on the Westtown farm.

A Member: What do you do now?

Mr. Huey: I told you what we do now; 1 pound of meal to 3 pounds of milk, with the balanced ration.

The Member: I think you meant to say you fed 1 pound of grain to 3 pounds of milk all through the year. Then you changed your ration?

Mr. Huey: We changed the rations.

A Member: When the cow drops milk in lactation, how is the feed to be cut down?

Mr. Huey: That is a question to which a great many met in our section will say no, and there have been men even in our cow-testing association who think that they want to feed the same the year round and some are. Of course, the cow-testing association—probably the majority know the workings under which it is done—they let every man do as he pleases and start to show him what he has done at the end of the year. There is no doubt where you have good silage you do not require any concentrated food with the silage to keep the cow in a thrifty condition. Now you must not omit the fact that silage is corn, that she is not cut down merely to a ration which would be a maintenance ration.

A Member: Do these feeders that maintain the same grain ration throughout the year have any trouble with milk fever?

Mr. Huey: Well, yes, they do. Of course, I have never had bother with that and I don't know that they do. The milk fever today I think is not much more looked at than garget or something of that kind. You know it is a common observation that a cow that had no fever when she freshened was perfectly worthless, and if she lived was worse off than if she died. It is not an uncommon thing to have a cow with milk fever back on ration and doing as well as before in three or four weeks' time.

Mr. Norton: For instance, a cow that is fed the year round, if they are good cows there is at least seventy-five per cent of them very hard to dry up. What would you do with that cow? Milk her through?

Mr. Huey: No, my experience has been that it is better to give her sixty days' rest if you can do it.

Mr. Norton: It is almost an impossibility to do that with a right good cow if you feed the same through the year.

Mr. Huey: Of course, when you commence to dry her up you have got to change the ration and bring down the amount, and if you watch your dairy herd rigidly you can have her in condition to calve.

Mr. Norton: I am one of the men that believe in feeding while the cows are dry, storing up some energy for the time they need it.

Mr. Huey: I guess the great majority of people today agree with you. We don't all do it. We all admit it is better to be done.

Mr. Comfort I was much surprised to hear of anyone having trouble with the milk fever in the East. For some of us it seems about as hard to cure as stomach ache in summer. The last few years the air treatment has saved all animals that have been sick in our neighborhood.

Mr. Eckert: It seems to me in listening to these discussions that one of the things that leads the average farmer, who has not been in the habit of doing these things, astray is the air of difficulty we throw around these different feed problems. I may be wrong, but that is my impression. At our farm the method has been that followed by Mr. Huey, having one pound of grain to three pounds of milk. Sometimes the farmer thinks you have got to weigh the grain every time you give it to the cow. We make up a balanced ration of grain which we don't change during the year. We have a box made that holds exactly two pounds of this grain, and then we string a wire in front of the cows on the feeding alley and we have a board on which are tacked cards that have the figures 1, 1½, 2, 2½, 3, 3½. I can take a foreigner into the barn and show him the box and the figures and he puts in so many boxes to each cow as indicated by the figures on the cards at their stall. We change these cards every two weeks. If the cow is dropping from 35 pounds of milk to say 30 pounds, she is reduced in proportion, so just as the cow begins to go back on us we begin to go back on her, and when she gets down close to the period when we ought to dry her up we start to cut off the grain entirely until the cow is dried off completely. As soon as she is dry, we start to feed four pounds of bran and one pound of linseed to meet the requirements Mr. Norton talks about, to put in good condition for maternity. It is wonderfully easy. Don't imagine that systematic feeding is a difficult proposition if you have some simple method like that. That is our way. It is an easy matter to have an entrance in the barn with the cards with the figures on and for sixty-five cows I can change all the numbers in a half hour. To be sure, I must know how much milk the cows are giving, but I take the milk cards and go through the barn and see what the cow has been giving and tack up a card to suit the requirement. The simplicity of the thing and its effectiveness is what I think should be impressed on any man who is interested in making the feed gas as far as possible. You won't have a cow go wrong on you, except once in a while you will probably have a cow that gets a little better in flesh than the rest and then give her less cornmeal. That is the one variation that we make; our herd is running close to 7,000 pounds; we have got a number of heifers in it and we think that is fair when the feeding is done mechanically.

Mr. Philips: I would like to say a few words along this line. It has been my experience in going around dairies and seeing the feeding done, that the best results are obtained by the ordinary farmer where he is in close touch with the individual cows, and where he does not intend to feed in proportion to the milk given. I think our larger records are made in that way, and the man doing his own work is generally in close touch with each individual cow and can feed that cow necessarily better than by set rule. I know there are some cows can make milk on less feed, because they will make 5 pounds of milk to every pound of feed they are getting; and by grading up in that way we are close in touch and I think the best results are obtained. I have told farmers that they could not pick out the best cows unless tested, and I believe it is true. Mr. Huey said in regard to feeding cows that sometimes the cows we thought the best were the poorest. When I started feeding cows I did not get far until I found that I was not getting what I wanted. I got a work on pure-bred cows and learned more about cows than I thought was in that.

I believe the salvation of the dairy farmer is the raising of his own cows. I think that at the prices cows are now he can raise them cheaper and get some that will do him good; but if you undertake to go to the cow sale you must get anything you can get and tuberculosis or anything else with it. The question was asked whether there was any section where they are raising dairy cows for sale. I don't know that they are raised especially for sale. I was out in Wisconsin last fall and learned that 700 carloads of dairy cattle were shipped out in one week and 250 grade Guernsey bulls in another one. I know a man in Des Moines, Iowa, that buys carloads and carloads of cows in the section around Philadelphia and sold him some. Common cows sell out there for as high as $140. He offered me $100 for a common cow last June which was 12 years old. These are the prices that western men are up against. What are the eastern men going to do if they don't raise their own cattle?

The Mayor of Philadelphia has appointed a committee to look into the sanitation of milk and they are about ready to turn in their recommendation. The milk dealers wanted them to recommend pasteurized milk, but they would not do that. It is a simple way of covering up all the dirty milk they are getting and getting it off their hands.

There is a movement now to change the testing of cattle for tuberculosis and I don't know what that will do, but it is being strongly advocated to make it so that every transfer of ownership of an animal must be accompanied with a tuberculosis test and in that way insure healthy cattle. It is important to profitable dairy cows. If you have a cow diseased, she cannot make profitable milk, and by requiring such a test we are bettering the farmer in the end. I have not found a single man that has tested his cattle who has not been well-pleased after he got started again, while his entire herds have been lost too.

I think this discusison leads very largely along market milk; that there has been injustice done all along to the producers, and that they have not received what they should for their milk. Skim milk is added to cream and sold as cream contrary to law and the milk is kept as long as possible by pasteurizing of kept with preservatives. That is done to the detriment of farmers like us, and they take a half a cent off the farmers for the whole milk. This is working against our farmers. I think something should be done to remedy that practice. There was a time here this fall when more skim milk was going into Philadelphia than whole milk.

Mr. Brown: If we can extend the discussion to the cost of butter production we have Mr. Smith here who can give us some figures on the Cost of Butter Production.

The Chairman: Mr. Smith has been called upon and we will be pleased to hear from him.

Mr. Smith: I did not come here with the expectation of making any statements, still I have a few figures. I have been keeping a record for some years back with my dairy. In fact, I started some 15 years ago with a grade Guernsey cow I bought for $30.00 at a sale and from that cow I graded up, always using a pure-bred bull, until last year I had cows making a record of 456 pounds of butter fat per year, one cow; and as well as making good butter fat this year, I have six cows that in nine months gave me about 6,000 pounds of milk apiece. I have just a few figures. They only run over nine months; this year's record beginning April 1st and continuing to January 1st. Probably the part that would would interest you the most is that my commercial feed in that nine months for fifteen cows has cost $380.00, or $25 1-3 per cow for nine months; that is, commercial feed. In addition to that I am feeding ensilage for half that time probably and the cows are on pasture the rest of the time, feeding some with hay and second-crop hay. In my year's work, in counting the feeds of the cows if I put so many loads of hay or second-crop hay in the mow I charge it to the dairy. I don't weigh what they eat each day or each feed, but it shows the year's work in that way.

As to milk-testing associations, I have two cows that have been tested since the 1st of April for the advanced registry and the tester that comes there is required to be there two days. While he was there I made use of him in testing all my grades and in that way I think I can keep a pretty correct record of what they are doing. I have not the record with me, but in that nine months from fifteen cows we have churned and put to market 4,292 pounds of butter. In giving the dairy average for the butter we don't give that average for the full price we get. The highest price we average is 37c, while at the retail market at Philadelphia it is bringing 43c. The lowest price has been 32c. Last year's work, after counting all the feeds we raised ourself and the commercial feeds that we bought and charging the labor and also giving credit for the manure, my profits were $50.00 per cow. Last week I had the tester there. The lowest test in the herd was 4.90 for one cow and the next lowest 5.20 and I have cows running from that on up. I may say the cow I bought for $30.00 and started with was from a man who was selling out Jersey and grade Guernseys. He brought a sample of milk from each cow to Philadelphia to have tested so that he would know which cow to sell and this was the highest test in the flock. He thought she did not give any milk, and he would not keep that cow, so he sold her to me. Her offspring, children and grandchildren and great-grandchildren have all been testing 5 and over right along. In fact, a granddaughter was tested last week, when milking ten days only, and her test was 5.30. She was a heifer with second calf and at that time giving 28 to 30 pounds of milk a day and had only freshened ten days before. I think it is an advantage for dairymen to raise their own stock, as I have proved conclusively in my own case, and, of course, we have the skim milk there all the time to feed the calves. We feed on skim milk until four months old. I may add further, I have been feeding six heifers in addition to my milk cows, and I simply feed the heifers, so that three heifers get about the same amount of feed as one cow. I have not been following it closely because I don't know how many pounds of milk the cows are giving. In other words, I feed for butter fat rather than milk. Some cows not giving as much milk give more butter fat. That is what I am after and feed for and in my feeding operation I try to feed a cow such a ration as will keep her in average flesh; if laying on flesh faster than she ought I cut down or if losing flesh I add a little fat to the feed.

Prof. Van Norman: I would like to add to this discussion a little bit by emphasizing two or three things in connection with this discussion on the cost of milk production. It was brought out right here this morning and it is brought out repeatedly in different meetings I have been to and by different men I have met, that when you find a man who don't spend all his time with a sickle, shovel and pitchfork, who is not kicking about the high cost of milk and no profit in farming, he is getting some accurate figures. You find a man that has demonstrated that he can produce milk at a profit. The lesson I get out of that is this: that the only salvation for the dairyman today is for him to be so constituted that he will get some accurate figures on what he is doing. If he is so constituted that he cannot get figures I see absolutely no hope for him, because I never yet heard in meeting or out of meeting of a man that has been making a big profit who cannot give figures. One of the things we learn in the educational work is to think, and I find that the fellow who thinks can argue forward or backward from a given point and I argue this way, that the men who are making money always have figures and the fellow that cannot make money rarely has figures. There must be some relation between figures and money, and I say the only salvation I see is for the men who are getting at this thing is to figure. When he does get to figuring he is going to find out a few things. One of them is that some of his good cows are only giving from 3,000 to 4,000 pounds of milk a year and there is no question about it that you cannot make a profit on a cow that gives but 3,000 pounds of milk a year, in any market in Pennsylvania today. There are not many in the State of Pennsylvania having cows producing 4,000 pounds of milk a year can make a profit on those cows if they charge up the labor.

The other thing was hinted at but not emphasized, as I hoped. One said that it cost very little more to produce a crop of silage that produced twenty tons per acre than it did to grow one that produced but ten tons. In that truth, gentlemen, is the foundation of profit in all farming, and in the feeding of the cow. It takes the first tons of silage to pay for the labor and it is not until you get more tons of silage to the acre than will pay for the labor of grawing corn that there is any profit in silage, and the same is true of the cow. It is not until she has produced milk enough to pay for the feed and labor and interest that there is any profit in the milk, and that takes more than 4,000 pounds. A representative of the Borden's Condensed Milk Company recently told me that they have figures of the milk production on over 4,000 farms in the State of New York. I think it was for the last twenty years. They know how many cows have been kept on those farms; they know what the average production per cow per farm is on the farms that supply them. That is the way the Borden Company makes money, by having the figures and knowing what they are doing. They know their business and their farmers' business. Not only are they able to fix the prices but see what the farmer can do because they know more about it than the farmer himself. They see that on those farms where the average is over 6,000 pounds per cow per year the farmers are making a reasonable profit and are reasonably satisfied and contented and going on with the production of milk; that on the farms where the average is less than that there is not only discouragement and dissatisfaction, but they are actually going out of the milk production business so fast that the Borden people are troubled to know where to get the amount of milk needed to furnish their customers in New York City. They can sell more milk in New York City than they can get; therefore their problem in New York and eastern territory is to get milk enough to meet their trade and they are limited because lots of the producers are going out of the business because they are not making a profit and the reason is that they are keeping poor cows. And so I say to the Pennsylvania farmers, that I believe that the solution of this proposition is the first-hand knowledge of what we are doing, because there are cows that will make a good profit at present prices, and I would not be a bit surprised if you will find that often there is actually more profit on the best 30 cows in a herd of 50 than there is on the whole herd. There are lots of men who will find they have been supplying the trade for glory instead of profit and that while not selling as much milk from 30 cows as they did when they had 50 cows, they would be much better off with the best 30. Get the facts. Somebody has got to supply the trade with milk from somewheres. What we are after is profit. That is what we have to have. There is many a fellow when urged to have his cows tested will say: Then I will have to sell my poor cows and not have enough milk to supply my trade. That is the argument over and over. It may be that he is under obligations to furnish a definite number of gallons of milk. I would cut out that obligation quick if I could not meet it and make profit; better make less milk and keep fewer cows and have a profit left. The only way is to get the figures of how much the cows are producing and what we are paying for the feed and labor. This feed proposition—the first thing you have to do is to keep the cow alive and it takes approximately the same amount to keep each cow going. After that all the good feed you can get a cow to eat up to the point of getting fat goes into milk production, and if you have got a cow that eats three times as much over maintenance as another cow she will make three times as much milk, but if the extra feed goes into body fat it does not count in the milk pail. It is the quantity of sialge raised over and above the cost of labor that makes the silage cheap food. It takes just as long to feed a poor cow as a good one; as long to haul the manure out from a poor as a good cow. We have got to get a surplus over and above cost and the place to commence to figure these matters is at home. A great many farmers in Pennsylvania do not take time to consider. What we need on many farms is to get one more farmhand, even at the prices you have to pay today, and then let the owner spend five hours a day using his wits and let the farmhand do the work he would do with his hands. That farmhand may cost 50c or maybe a little more, but the man who is feeding thirty or forty cows will have time to use his wits and an hour spent in watching the men plowing or feeding, or studying the cows, or how to save time for the other men will earn several times 50c. He will study the amount of time to do the chores, see to getting the maximum amount of results in a given number of hours. That is head-work and few men can do that head-work and do a day's work with their hands also. There are farms where it is not practical to do this, but many where it is, and the man who can do it can make money and profit by producing good cows and selling milk at present prices and can make a large individual volume of milk from the cows he keeps and not dilute the herd with the poor cows. The cow testing association is simply a book-keeper hired to do the figuring which you often cannot or do not wish to do. We cannot successfully conduct any other business today without a book-keeper and we must keep strict account in the dairy business also. I want to emphasize this point, that it is business methods and exact knowledge of detail costs we must have to be successful. (Applause.)

The Chairman: We will have to go on with our program. Is Prof. Kelly ready to make his report?

Prof. Kelly: At your pleasure, Mr. Chairman.

The Chairman: Ladies and gentlemen, I have the pleasure of introducing to you Prof. A. C. Kelly, of Washington, D. C., who will make his report on the judging of the milk and cream exhibits.

REPORT ON MILK AND CREAM EXHIBITS

Prof. A. C. Kelly, Washington, D. C.

Ladies and Gentlemen: I am sorry that I have not been able to report on these milk and cream samples before, but milk and cream are not judged as easily as butter is. It takes some time to do this. I got to town Sunday night and, commencing Monday, I have been working on the milk and cream samples and just got finished this afternoon.

Now, we have had upstairs fine exhibits of corn and fine exhibits of fruit, but I want to say that the man who exhibits good, clean milk—or rather the man who produces on his farm good, clean milk—is one of the mose peaceful citizens in this community. Now, fruit we may regard partly as a luxury, but milk is an absolute necessity. Milk is used not only for adults, but it is the sole food for a great many children, so that the man who produces clean milk is not only a useful member of the community, but a true scientist; so many things enter in the production of clean milk and good milk, chemistry and bacteriology, that the producer of clean milk is a scientist.

Now, in the certified milk class the farm scoring the highest rating was the Willow Brook farm, at Willow Grove, where they scored 96¾ points. In the market milk the highest rating was scored by the Pencoyd farms, with a score of 96 points out a possible hundred. The second place, or those receiving honorable mention with milk, and that means a score of over 90 points out of a hundred, were S. E. Morse and Son with a score of 94, J. L. Balderson with a score of 93¼ and J. R. Kendig with a score of 90¾. In the cream, the man having the highest scoring cream in the contest was S. E. Morse and Son with a score of 94 points out of a possible hundred.

Now, may I have a few moments to explain the method of scoring?

The Chairman: Go ahead.

Prof. Kelly: I have here some of the milk that was entered in the contest. There is the certified milk that won the first prize. Here is the market milk that won first place; and here is the market cream that won first place.

Now, the keynote of all these meetings this week has been quality. Milk is one thing in which the quality has been neglected for a long time.

And what do we mean by quality in milk? Some people may say, the amount of cream or butter fat—I have heard people passing the exhibits upstairs and looking at the cream around the top of the bottles say "That is fine milk. Look at the cream on it." We know now there is a great deal more meant by the word "quality" as applied to milk than mere composition. We know that cleanliness is of prime importance. There are two reasons: first, the sentimental standpoint, and, second, what I call the economical standpoint. The sentimental standpoint has to do with the danger from disease from dirty milk, but I won't touch on that because our time is so limited tonight.

The samples are scored on a basis of one hundred points: 35 points are allowed for bacteria, 25 points for flavor and odor, 10 points for fat, 10 points for solids not fat, 10 points for freedom from possible sediment in the bottom of the bottle, 5 points for acidity, and 5 points for appearance of bottle and cap. I just want to run over briefly what goes to make these points. First of all, the flavor and odor are influenced by several things. They are influenced by bacteria. I have a sample here which any of you that are interested can smell after this meeting is over. That has a very putrifactive odor. Here is another sample. This has a clean, sour odor. This has a different class of bacteria working in the milk, and bacteria govern the different odors before the milk is sterilized. This one here has a smell that comes through feeding bad silage or feeding at the wrong time or way. The time to feed silage or any other feed of that kind is right after milking and then the odor has time to be distributed before the next milking. Care should be taken when the feeding silage to sweep up all that is scattered about after the cows are through and never leave any silage laying about the barn.

The question of bacteria—what are these bacteria? They are little spores and they fall into the pail and they need warmth and food and moisture for their growth. They find all these elements in milk and as soon as they fall in there from the dust of the cow's body they start to grow and multiply, some of them once in every few hours and unless the milk is cooled down immediately the work goes on energetically and very soon reaches enormous proportions. So we must keep the dirt out of the milk in the first place and cool the milk right down to check this bacterial growth and keep the milk clear. Now, the dirt and bacteria come from the cow, the stable, air, or barn. There is dirt and dust sifts down from the hay overhead and when the cows are not brushed off, we get contamination from them. Then sometimes we do not have the platform the length of the cow; the cow gets back to the gutter; and the gutters are not deep enough. The gutters ought to be built deep enough so that the cows will keep clean; we ought to use clean bedding; and the walls and floor ought to be as smooth and clean as possible. You may say that is folly and it will not hurt the milk. It is going to make the work of keeping things clean easier if the walls and floor are smooth. It does not cost very much to build a barn where sanitary milk can be produced. It does not take a rich man to build such a barn. It costs the same as other barns. It has just to be plain and simple with no disease catchers and no dirt catchers. The manure wants to be taken away. One of the greatest wastes on the farm is right in the manure pile. It should be taken right out on to the fields at once. If the manure is piled up against the barn and there is water running through it, we are losing fertilizing value from it.

There are so many more things I would like to touch on—the milk house and cleanliness of milk. The worst faults I found with these: the acidity was all right, the chemical composition was all right, bacteria was pretty fair, but the flavor and odor are pretty badly off on the majority of the samples. There were some very good ones there, some better than I have scored anywhere else this fall on flavor and odor, but this is a very general defect; and then the bacteria, the scores did not run very high. The Pencoyd farm and S. A. Morse and Son make the highest score in bacteria in milk and S. A. Morse and Son for bacteria in cream.

A Member: Does that mean the fewest bacteria?

Prof. Kelly: The fewest bacteria. For flavor and odor the Willow Brook farm had the best flavored milk in the exhibit. The Pencoyd farm and S. E. Morse and Son with their cream were second. Freedom from possible dirt in the bottom of bottle, J. L. Balderson had the best sample on the exhibition. No matter how carefully you think you strain the milk, just let it stand a couple of hours and pick the bottle up and look at the bottom and see if you can see any sediment. Any specks in the bottom of the bottle will debar you from a perfect score under the head of dirt. Some of the bacteria count ran very high. Our perfect score for bacteriais only 400 a cubic centimeter. Certified milk agents usually require 10,000 or less, so that you see a score of 400 is mighty fine. The highest score we had was 374,000 and we had one of 5,000 and one of 16,000, another of 23,000, and one of 52,000, so you see we had at least five or six samples that more than beat the standard for certified milk. So that on the whole the bacteria counts were good. The certified score of 90 made by the Pencoyd farm is an exceptionally high score and denotes a superior product, and all those men who received 90 points or over are to be congratulated. They have accomplished a great deal, those who are in the 90 class, the honorable mention, and I do not want them to feel discouraged. The value of a contest is twofold: it is primarily educational, and at the same time it has a commercial value. I have two letters received the other day after a competition, one showing the educational value in which the writer notes that he lost on odor and that it was due to the manner of feeding at the time of milking. This man learned a lesson from that condition. We talked to him afterwards just as we have done here tonight. The next competition he goes into he will know how and when to feed in order to make good on the flavor and odor. The other letter shows the value of these competitions from an advertising standpoint. The writer says that the next morning after the announcement that he had won the people came from every direction to congratulate him on his success. He says he had not expected to win among older and more experienced dairymen, but that he was very much gratified and had learned where he could make still more improvement. So we have two letters received, one showing the educational value and the other the commercial value of these contests. (Applause.)

Prof. Van Norman: Mr. Chairman, while the people are all seated I would like to have them smell the difference in these two lots of milk, and on the strength of what the judge has said I want you to know the difference. Lots of people who have not examined the milk from different herds do not realize how different the two lots are. Smell the one and then follow with the second and those of you whose nose is working will note the difference and for the rest of you there is no hope. (Milk samples passed around.)

A Member: Might I ask if they were scored on the same score card, the certified with the market milk?

Prof. Kelly: Yes, we use the same card for all. The appearance is judged whether a dirty bottle or on this outside cover. Not only the outside cover adds to the looks of the package but adds to the value of it. We want to provide against dirty water running onto the cap or down the bottle. The paraffine on top of the cap and bottle as used here adds not only to the looks, but to the sanitary value of the package. I have some of the bacteria plates made from the milk. Each one was made from two-tenths of a drop of milk. You can see white dots on them. They represent the bacteria. If you want to you can take the lid off and smell them.

The Chairman: The time is up for this most interesting subject.

We will call for the reports of committees. The first will be the report of the Committee on Resolutions of the Dairy Union.

Mr. Hall then presented and read the report of the Committee on Resolutions as follows:

Resolutions of the Pennsylvania Dairy Union.

Whereas, The Dairy Division of the United States Department of Agriculture has rendered valuable assistance at our meeting by sending Mr. B. D. White and Mr. E. Kelly to address our meeting and score the butter and milk.

Resolved, That we hereby tender our thanks to the Secretary of Agriculture for this valuable assistance.

Whereas: The State Department of Agriculture under the direction of Secretary N. B. Critchfield and his able assistant, A. L. Martin, have rendered valuable assistance to the dairymen of the State:

Resolved: That the thanks of the Association be extended to these gentlemen for this good work.

Whereas: Mr. S. F. Barber has so ably taken care of the local arrangements, making successful the exhibits of machinery, butter and milk:

Resolved: That the thanks of the association be extended to him.

Whereas: The Conference Committee on the control of tuberculin testing has not completed its work, be it

Resolved: That the same committee be continued.

Whereas: The dairy interests will be greatly benefited by the holding of a State Fair.

Resolved: That the Dairy Union favor the passage of a bill creating an annual State Fair.

Whereas: The holding of joint meetings has been so successful:

Resolved: That we recommend to our officers that this practice be continued.

Whereas: There is great need of instruction work among the dairymen of the State;

Whereas: Other of the leading dairy States have been greatly benefited by educational work in the dairy industry;

Whereas: State College with its corps of trained instructors is amply competent to take up the work of carrying on co-operative feeding experiments that would suggest to the milk producer better methods of feeding; the organization of self-supporting cow-testing associations which would show the profitable and unprofitable cows, eliminating the unprofitable cows and thereby increasing the net profits of the dairymen.

The investigation as to how the kind of milk required by our cities can be produced at the least cost in investment and cost of operation.

The instruction of butter makers in the best methods of manufacturing butter.

Whereas: Additional funds to State College will be necessary for the carrying out of this work:

Resolved, That we urge the appropriation of sufficient funds for general extension work.

C. W. LARSON,
HENRY N. WOOLMAN,
R. J. WELD,
W. E. PERMAN,
R. C. HALL.

The Chairman: Gentlemen, you have heard the reading of the resolutions. If there are no remarks or objections they will stand approved as read and the committee be discharged.

The Auditing Committee will next make their report.

A Member of the Auditing Committee: It seems the other members of the committee have gone home and we have no report made up. We have not got all the items yet.

The Chairman: The amount of money received and amount of money expended?

The Member of Committee: It is $711. Some is on hand.

The Chairman: Will you please make out your report more explicitly and have it placed on the record? We will continue that committee.

Secretary Van Norman: I would like to add for your information that

the Treasurer's Report shows that the receipts by the Dairy Union have been about $1,300, including that from the State, and that the disbursements have been about $600 for the past year. That does not include accounts payable. There are some that will reduce the balance more or less.

The Chairman: The Committee on Nominations will please report.

Mr. Miner presented the Report of the Committee on Resolutions, as follows:

Report of Committee on Nominations.

We, your Committee on Nominations, beg leave to respectfully nominate as follows:

For President—H. M. Stokes, Hanover, Pa.
For Vice President—M. T. Phillips, Pomeroy, Pa.
For Secretary—H. E. Van Norman, State College, Pa.
For Treasurer—W. D. Marshall, Lyndell, Pa.
For Directors—W. E. Perham, Niagara, Pa.
A. B. Huey, Lenape, Pa.
R. J. Weld, Sugar Grove, Pa.
D. R. Stephens, Sayre, Pa.
George G. Paxton, Huston, Pa.
Henry Woolman, Philadelphia, Pa.

(Signed) E. D. MINER,
S. T. YOST.

The Chairman: You have heard the report. What action will you take on it?

A Member: I move the report be adopted as read.

The motion was seconded, put and carried.

Mr. Norton: Gentlemen, the right way is for the Committee on Nominations to present their report and then to make it legal there should be a motion made to authorize the secretary to cast the ballot for the gentlemen nominated.

Secretary Critchfield: I move you, gentlemen, that your secretary be authorized to cast the ballot for the gentlemen named by the committee.

The motion was seconded, put and carried.

The Chairman: Prof. Van Norman, our secretary, is authorized to cast the ballot for the gentlemen named by the Nominating Committee.

Secretary Critchfield: Mr. Chairman, if there is no objection, I would like to amend my motion by saying that Mr. Norton shall cast the ballot, seeing that your secretary is a nominee.

Mr. Norton: Gentlemen, I cast the ballot for the nominees named by the Committee on Nominations.

The Chairman: I declare the gentlemen named by the Nominating Committee elected to their respective offices.

Is there any other business before the Dairy Union? Do you know of any new business, professor, that we have forgotten? If not, we will close the Thirteenth Annual Convention of the Pennsylvania State Dairy Union, and we want to thank everyone for their kind attention and for help in making it a success.

Secretary Critchfield: Before you declare the meeting adjourned permit me to make an announcement. I would be very glad to meet the officers of the Dairy Union and State Livestock Breeders' Association and the Horticulture Society for a little while at my office before we finally part.

The Chairman: At what hour?

Secretary Critchfield: Say one o'clock.

Prof. Van Norman: Mr. Bayard is going out at half-past twelve. Would it not be convenient to meet as soon as the officers of the Livestock Breeders' Association are elected and their business concluded?

Secretary Critchfield: That will be the arrangement. We will meet immediately upon your final adjournment. Adjourned.

EXHIBITORS AND SCORES

Exhibitors, 1911, who received a score of 90 or above.

Creamery Butter

Ephriam Zug, Prescott Station	92
Harry E. Ott, Wismer	94
W. D. Marshall, Lyndell	93½
Otis Blish, McCall Ferry	93
Brandywine Dairies, West Chester	92
O. D. Mott, Edinboro	cup 95
Guernsey Creamery Co., Guernsey	94
H. H. Stivel, Quakertown	92

Dairy Butter

S. E. Morse & Son, New Milford	91
Horace T. Smith & Son, Buckmanville	90½
Austin Leonard & Son, Troy	91½
White Horse Farm, Paoli	cup 95

Market Milk

S. E. Morse & Son, New Milford	94
J. L. Balderson, Kennett Square	93¼
John R. Kendig, Pomeroy	90¾
Pencoyd Farm, Bala (Silver Cup)	96

Market Cream

S. E. Morse & Son, New Milford (Silver Cup)	94

Certified Milk

Willowbrook Dairy, Willow Grove (Silver Cup)	86¾

LIST OF CREAMERIES AND CHEESE FACTORIES IN PENNSYLVANIA

Co-operative Creameries—

Britton Run Co-op. Creamery, Spartansburg, Pa.
Clinton Creamery Co., Creamton, Pa.
Church Creamery Co., R. D., Knox, Pa.
East Rush Creamery Co., East Rush, Pa.
Franklindale Creamery Co., Ltd., R. D. 8, Towanda, Pa.
Farmers' Co-operative Creamery Association, Milnor, Pa.
Hadley Creamery Co., Inc., Hadley, Pa.
Montoursville Co-op. Creamery Co., Montoursville, Pa.
Little Cooley Creamery Co., Little Cooley, Pa.
Manheim Condensed Creamery Co., Manheim, Pa.
New Bedford Creamery Co., New Bedford, Pa.
Nununedah Creamery Co., Smethport, Pa.
Quarryville Dairy Co., Quarryville, Pa.
Red Oak Creamery Co., R. D. 84, Spartansburg, Pa.
Silver Spring Dairy Co., McCall Ferry, Pa.
Sparta Creamery Association, Spartansburg, Pa.
Spinnerstown Dairymen's Association, Spinnerstown, Pa.
Spring Brook Creamery, Dyberry, Pa.
Fairdale Co-operative Creamery, Fairdale, Pa.
Fairmont Creamery, Font, Pa.
Fairview Village Creamery Association, Fairview Village, Pa.
Alba Butter and Cheese Mfg. Co., Alba, Pa.
Auburn Four Corners Creamery Co., Auburn Four Corners, Pa.
Austinville Co-operative Creamery Co., Columbia Cross Roads, Pa.
C. Z. Beiler Creamery, New Holland, Pa.
Cadis Creamery Co., Cadis, Pa.
Choconut Valley Creamery Co., Choconut, Pa.
Cochran Creamery Co., Cochranville, Pa.
Cold Spring Dairymen's Association, Doylestown, Pa.
Congo Creamery Co., Fulton House, Pa.
Co-operative Creamery, Centerville, Pa.
Corydon Creamery, Corydon, Pa.
Crystal Spring Dairymen's Association, Carversville, Pa.
Dairymen's Association of Klecknersville, Bath, Pa.
East Troy Creamery Co., R. D. 63, Troy, Pa.
Eldersride Creamery Co., Saltsburg, Pa.
Elk Creamery Company, Scandia, Pa.
Excelsior Co-operative Creamery Co., Birchardville, Pa.
Fallsdale Creamery Association, Fallsdale, Pa.
Farmers' Creamery Co., Woodbury, Pa.
Farmers' Creamery Association, Worcester, Pa.
Farmers' Creamery Company, Mount Joy, Pa.
Farmers' Creamery Company, Ltd., R. D. 5, Manheim, Pa.
Forest Grove Dairymen's Association, Forest Grove, Pa.
Forest Lake Creamery Co., Forest Lake, Pa.
Franklin Co-operative Creamery Co., Edinboro, Pa.
Friendsville Co-operative Creamery Co., Friendsville, Pa.
Gap Creamery Company, Gap, Pa.
Glyndon Creamery Co., R. D., Spartansburg, Pa.
Goldendale Creamery Co., Inc., Edinburg, Pa.
Granville Summit Creamery Co., Granville Summit, Pa.
Harford Butter and Cheese Association, Harfard, Pa.
Herrick Elgin Butter Factory, Uniondale, Pa.
Hillegrass Creamery, R. D., Pennsburg, Pa.
Hobbie Co-op. Creamery Association, Wapwallopen, Pa.
Iron Bridge Dairy Association, Little Meadows, Pa.
Jackson Center Creamery Co., Ltd., Trowbridge, Pa.

Jersey Hill Creamery Co., Rushboro, Pa.
Kempton Creamery, Kempton, Pa.
Lackawanna Co-operative Creamery, Prompton, Pa.
Lawn Creamery Company, Lawn, Pa.
Lawsville Center Creamery Co., Lawsville Center, Pa.
Liberty Valley Creamery Co., Liberty, Pa.
Little Meadow Creamery Co., Little Meadows, Pa.
Loux Creamery Co., Allentown, Pa.
Loux Creamery Co., Trexlertown, Pa.
Lucinda Elgin Creamery Co., Lucinda, Pa.
Masterson Creamery Association, Mastersonville, Pa.
Montgomery Creamery Co-op. Association, Mercersburg, Pa.
Montrose Creamery Co., Montrose, Pa.
Niagara Creamery Co., Niagara, Pa.
Orrtana Creamery Co., Orrtana, Pa.
Perkiomen Dairymen's Association, Creamery, Pa.
Plymouth Valley Creamery, Narcissa, Pa.
Plumsteadville Creamery, Plumsteadville, Pa.
Quaker City Creamery Co., Brackney, Pa.
Rock Glen Creamery Co., Rock Glen, Pa.
Rush Co-operative Creamery Co., Rush, Pa.
Salem Creamery Co., Emlenton, Pa.
Salem Creamery Co., Lamartine, Pa.
Saratoga Creamery, R. D. 4, Pottstown, Pa.
Cilverdale Creamery Co., East Canton, Pa.
Stewartstown Co-operative Creamery, Stewartstown, Pa.
Sunnyburn Creamery Co., Sunnytown, Pa.
Union Dairymen's Association, Wismer, Pa.
Warnick's Dairymen's Association, Jamison, Pa.
Warren Center Creamery Co., Warren Center, Pa.
West Jackson Creamery, Lawrenceville, Pa.
West Lathrope Creamery Co., Nicholson, Pa.
Winwood Dairy Association, Winwood, Pa.
Woodbury Creamery Co., Altoona, Pa.

Individually Owned Creameries—

Arbuckle Creamery, R. D. 7, Union City, Pa.
Bethlehem Creamery, Bethlehem, Pa.
Cloverdale Elgin Butter Factory, R. D. 76, Titusville, Pa.
Dewart Creamery, Dewart, Pa.
S. B. Brodbeck Creamery, Brodbecks, Pa.
Bridgeton Creamery, Bridgeton, Pa.
John I. Carter & Cons Company, Chatham, Pa.
Chadds Ford Creamery, Chadd's Ford Junction, Pa.
Darlington Creamery, Pomeroy, Pa.
Fredericksburg Creamery, Fredericksburg, Pa.
Hecktown Creamery, Hecktown, Pa.
Howard Creamery Co., Center Hall, Pa.
Howard Creamery, Glen Hall, Pa.
Jamison Bros. Creamery, R. D. 65, Emlenton, Pa.
Landis Store Creamery, Landis Store, Pa.
Levan Creamery, Lenhartsville, Pa.
Levin Dairymen's Association, R. D. 1, Chalfont, Pa.
Maple Place Creamery, Lander, Pa.
Theo. M. Moyer Creamery, Ferndale, Pa.
New Berlin Creamery, New Berlin, Pa.
New Era Creamery, R. D. 41, Wylausing, Pa.
Rutland Creamery, Troy Creamery Co., Troy, Pa.
Spring Grove Creamery, Spring Forge, Pa.
Turbotville Creamery, Turbotville, Pa.
Troy Creamery, Troy, Pa.

Abington Dairy Co., Inc., 322 Linden St., Scranton, Pa.
State Line Creamery, Akeley, Pa.
Acme Creamery, Sugar Grove, Pa.
Albany Creamery, Albany, Pa.
G. E. Allen, R. D. 46, New Albany, Pa.
Altenwald Creamery, Altenwald, Pa.
Bath Creamery, Bath, Pa.
Bear Lake Creamery, Bear Lake, Pa.
Beaverdam Creamery, R. D. 10, Corry, Pa.
Beaver Springs Creamery, Beaver Springs, Pa.
Bedminster Creamery, Bedminster, Pa.
Belleville Creamery, Belleville, Pa.
H. A. Benninger Creamery, Benningers, Pa.
Berne Creamery, Berne, Pa.
Bernville Creamery, Bernville, Pa.
Berwick Creamery, Berwick, Pa.
J. E. Bigart Creamery, Ariel, Pa.
Bingen Creamery, Bingen, Pa.
Birchrunville Creamery, Birchrunville, Pa.
Blooming Glen Creamery, Blooming Glen, Pa.
Blue Mountain Creamery, Waynesboro, Pa.
Blue Spring Creamery, Richland Center, Pa.
Blanch Valley Creamery, R. D. 2, Telford, Pa.
Brogueville Creamery, Brogueville, Pa.
Brookside Creamery, Sugar Grove, Pa.
Garrett E. Brownback, Elgin Creamery, Pittstown, Pa.
Brubaker Creamery, Brubaker, Pa.
William A. Buoo, New Freedom, Pa.
Buffalo Valley Creamery, R. D. 1, Lewisburg, Pa.
Bursonville Creamery, Springtown, Pa.
Butler Pure Milk Company, Inc., Butler, Pa.
Champion Creamery, Landisville, Pa.
E. S. Clark Creamery, Akeley, Pa.
Clear Spring Creamery, R. D. 2, Richland Center, Pa.
Clemo Creamery, Clemo, Pa.
Clifford Creamery Co., Clifford, Pa.
Clintondale Creamery, Clintondale, Pa.
Cold Spring Creamery, Loysville, Pa.
Cold Springs Creamery, Montandon, Pa.
Columbus Creamery, Columbus, Pa.
Hunter Patterson Creamery, Webster Mills, Pa.
Coopersburg Butter Factory, Coopersburg, Pa.
Cottage Hill Creamery, R. D. 5, Union City, Pa.
Crystal Spring Creamery, Berlin, Pa.
Cumberland Valley Creamery Co., Mechanicsburg, Pa.
Deep Run Creamery, R. D. 2, Perkasie, Pa.
Deep Park Creamery, 1024 R. E. T. Bldg., Landenberg, Pa.
Wilson H. Degler Creamery, Womelsdorf, Pa.
Denver Creamery, Denver, Pa.
Deodate Creamery, Deodate, Pa.
Dillsburg Elgin Creamery, Dillsburg, Pa.
Douglassville Creamery, Douglassville, Pa.
Drakes Corner Creamery, Hatfield, Pa.
East Berlin Creamery, East Berlin, Pa.
East Branch Creamery, R. D., Cpartansburg, Pa.
East Greenville Creamery, East Greenville, Pa.
Empire Creamery, North East, Pa.
Energy Elgin Butter Co., New Castle, Pa.
Ephraim Zug Company, Prescott, Pa.
Fairview Creamery, Blainsport, Pa.
Featherman & Fabel Creamery, East Stroudsburg, Pa.

Fleetwood Creamery, Fleetwood, Pa.
H. H. Fogelsanger & Co., Creamery, Green Village, Pa.
Fount Dale Creamery, Fayetteville, Pa.
P. J. Foust Creamery, Sigmund, Pa.
Franconia Creamery, Souderton, Pa.
Franklin Corners Creamery, R. D. 1, Fairview, Pa.
Gablesville Creamery, R. D. 1, Bechtelsville, Pa.
J. A. Gailey Creamery, New Park, Pa.
Henry G. George Creamery, Lansdale, Pa.
Gibertsville Creamery, New Berlinville, Pa.
Daniel S. Givler Creamery, Denver, Pa.
Glenside Creamery, Granville Summit, Pa.
Glenwood Cheese Factory, Glenwood, Pa.
Green Tree Dairymen's Association, Inc., Obelisk, Pa.
Griesemersville Creamery, Griesemersville, Pa.
D. S. Grisinger Creamery, McConnellsville, Pa.
Guernsey Creamery, Guernsey, Pa.
J. G. Haldeman Creamery, Thompsontown, Pa.
Abraham F. Halteman Creamery, Franconia, Pa.
Hanover Creamery Co., Hanover, Pa.
Harleysville Creamery, Harleysville, Pa.
Harmonsburg Butter Factory, Harmonsburg, Pa.
Harrisville Creamery Co., Harrisville, Pa.
D. & W. H. Hartman Creamery, Oley, Pa.
Hatch Hallow Creamery, Union City, Pa.
Hawthorne Creamery, Monroeton, Pa.
Edward Helb Creamery, Railroad, Pa.
Herbine & Kime Creamery, First Street, Birdsboro, Pa.
Herstand Creamery, Spring City, Pa.
H. H. Heyburn Creamery, Brandywine Summit, Pa.
High Ground Dairy Co., Inc., Hop Bottom, Pa.
High Lake Creamery, High Lake, Pa.
Hillchurch Creamery, Hillchurch, Pa.
W. C. Hinsbaugh Creamery, Centerville, Ca.
Hires Condensed Milk Co., Malvern, Pa.
Charles Hoffman Creamery, Mount Cobb, Pa.
George W. Hoffman creamery, North Wales, Pa.
John Holly Creamery, Colmar, Pa.
Hosensack Creamery, Hosensack, Pa.
Howard Creamery, Inc., 103 E. High Street, Bellefonte, Pa.
Jacob S. Hummel Company, Saylorsvurg, Pa.
India Creek Creamery, Franconia, Pa.
India Creek Creamery, R. D. 2, Telford, Pa.
Ironville Creamery, Hallertown, Pa.
I. X. L. Creamery, Inc., Friedens, Pa.
Jersey Shore Creamery, Jersey Shore, Pa.
Johnstown Sanitary Dairy Co., Johnstown, Pa.
Jordan Creamery, Oxford, Pa.
Katans Creamery, R. D. 11, Corry, Pa.
Kellers Church Creamery, Kellers Church, Pa.
Kimberton Creamery, Kimberton, Pa.
Klinesville Creamery, Klinesville, Pa.
Klopp & Kalbach Creamery, North Heidelberg, Pa.
F. H. H. Knight Creamery, New Bethlehem, Pa.
Samuel Koons Creamery, Gratesford, Pa.
H. S. Kratz Creamery, Nazareth, Pa.
Kreidersville Creamery, R. D. 3, Kreidersville, Pa.
Kunkle & Pyle Creamery, Gatchellville, Pa.
Kutztown Creamery, Kutztown, Pa.
Lackawanna Dairy Co., Main Street, Nicholson, Pa.
Lake Como Butter Mfg. Co., Lake Como, Pa.
Lanark Creamery, Lanark, Pa.

Lancaster Creamery Co., Lancaster, Pa.
Lander Creamery Co., Lander, Pa.
R. D. Landis Creamery, Milford Square, Pa.
J. S. Lavery Creamery, Lavery, Pa.
Nathan H. Leaser Creamery, Palm, Pa.
Lebanon Valley Creamery Co., Derry Church, Pa.
Lenover Creamery, Lenover, Pa.
Austin Leonard & Son, R. D. 63, Troy, Pa.
Le Raysville Creamery Co., Le Raysville, Pa.
Limekiln Creamery, Limekiln, Pa.
Limeport Creamery, Limeport, Pa.
Lincolnville Creamery Co., R. D. 4, Union City, Pa.
Loganton Creamery, Loganton, Pa.
Lovell's Creamery, R. D. 9, Corry, Pa.
John McDonald Creamery, Londonderry, Pa.
McKean Creamery, McKean, Pa.
Maginness & Beiler, Christiana, Pa.
Maiden Creek Creamery, Calcium, Pa.
Mainland Creamery, Mainland, Pa.
Manheim Creamery, Manheim, Pa.
Manifold & Wallace Creamery, York Street, Highrock, Pa.
W. S. Markley Creamery, Pottstown, Pa.
J. R. Meck Creamery, Meckville, Pa.
Mifflinburg Creamery Co., Mifflinburg, Pa.
Mill Creek Creamery, Kutztown, Pa.
Irvin Miller Creamery, Reading, Pa.
Mill Village Creamery, Mill Village, Pa.
Millville Creamery Co., Millville, Pa.
Milroy Creamery Co., Milroy, Pa.
Minerva Creamery, 525 1st Ave., Pittsburgh, Pa.
Mohrsville Creamery, Mohrsville, Pa.
Moorestown Creamery, Moorestown, Pa.
Johnston Moorhead Creamery, Sample Run, Pa.
Mount Bethel Creamery Co., Mount Bethel, Pa.
Mount Pleasant Creamery Co., Mount Pleasant, Pa.
Moyer & Eby Creamery, Campbelltown, Pa.
E. C. Musselman Creamery, Overton, Pa.
Myerstown Creamery, Myerstown, Pa.
Neshannock Falls Butter Co., Neshannock Falls, Pa.
New Galena Creamery, Levin, Pa.
New Jerusalem Creamery, New Jerusalem, Pa.
North Branch Creamery, Perkasie, Pa.
North Warren Creamery, R. D. 2, Warren, Pa.
Overshort Creamery, Towanda, Pa.
Pennsylvania Creamery Co., Inc., Knoxville, Pa.
Pennsylvania Creamery Co., Milan, Pa.
Perkiomenville Creamery, Perkiomenville, Pa.
Petersville Creamery, Kreidersville, Pa.
S. E. Phiel Creamery, Williamson, Pa.
Piersons Creamery, Waymart, Pa.
Pikeland Creamery Co., Anselman, Pa.
Pipersville Creamery, Pipersville, Pa.
Pleasant Valley Creamery Co., Milton, Pa.
Pleasantville Creamery, Manatawny, Pa.
Pocono Creamery, Tannersville, Pa.
Porters Creamery, Porters Sideling, Pa.
Prospect Creamery, Prospect, Pa.
Pugtown Creamery, R. D. 1, Spring City, Pa.
Reifsnyder & Fry Creamery, R. D. 1, Denver, Pa.
Reisst, Nissley & Co., Creamery, Mount Joy, Pa.
Richardson's Creamery, Hamburg, Pa.
Chas. M. Richardson's Creamery, Bernville, Pa.

Richlandtown Creamery, Richlandtown, Pa.
Rock Springs Creamery, Tyrone, Pa.
Rome Creamery, Towanda, Pa.
W. D. Rose & Co. Creamery, R. D. 2, Mansfield, Pa.
Rosedale Creamery, Shelly, Pa.
Rushing Spring Creamery, Kumry, Pa.
Salfordville Creamery, Salfordville, Pa.
Salona Creamery, Salona, Pa.
Sassamansville Creamery Co., Sassamansville, Pa.
Schuler Bros. Creamery, Vera Cruz, Pa.
Geo. Seip Creamery, Lenhartsville, Pa.
P. E. & W. Sharpless Co. Creamery, Ward, Pa.
Shartlesville Creamery, Shartlesville, Pa.
W. R. Shuler Creamery, Zionsville, Pa.
Silverthorn Creamery, Edinboro, Pa.
Harry W. Smith Creamery, Kresgeville, Pa.
South Gibson Creamery Association, South Gibson, Pa.
A. A. Spannutt Creamery, R. D., Myerstown, Pa.
Springboro Creamery, Springboro, Pa.
Star Creamery, Elk Lake, Pa.
H. H. Stauffer Creamery No. 1, Bechtelsville, Pa.
H. H. Stauffer Creamery Co. No. 2, R. D., Oley, Pa.
Steen's Creameries, Butler, Pa.
D. R. Stephens Creamery Co., Sayre, Pa.
Charles H. Stickell Creamery, Waynesboro, Pa.
Jacob S. Stover Creamery, Tohickon, Pa.
Stumptown Creamery, Bird-in-Hand, Pa.
Table Rock Creamery, Table Rock, Pa.
Tinicum Creamery, Bedminster, Pa.
J. Trumbauer & Son Creamery, Finland, Pa.
Trumbauersville Creamery, Trumbauersville, Pa.
Turner & Wescott Creamery, Glenroy, Pa.
Wm. F. Unger Creamery, Lederachsville, Pa.
Wm. F. Unger Creamery, Schwenkville, Pa.
Aaron Walmer Creamery, Myerstown, Pa.
Wattsburg Creamery, Wattsburg, Pa.
R. N. Weatherford Creamery, Lyon Valley, Pa.
West Auburn Creamery, West Auburn, Pa.
West Branch Creamery, Muncy, Pa.
West Chester Dairy, 110 W. Washington Street, West Chester, Pa.
Westgrove Creamery, West Grove, Pa.
Wheir Lake Creamery, Gilbert, Pa.
Farmers' Dairy Co., Inc., Wilkes-Barre, Pa.
Willow Hill Creamery, Willow Hill, Pa.
Yellowhouse Creamery, Yellowhouse, Pa.
Youngs Creamery, Youngs, Pa.
Peter Zacharias Creamery, Reading, Pa.

Co-operative Cheese Factories—

Co-operative Cheese Factory, Greenville, Pa.
Congo Creamery Co., Congo, Pa.
Eastern Bradford Cheese Co., Le Raysville, Pa.
Farmers' Creamery Association, Worcester, Pa.
Kinney Co-op. Cheese Factory, Kinney, Pa.
Farmers' Protective Association, Linesville, Pa.
Lix Co-operative Cheese Factory, R. F. D., Athens, Pa.
Millerton Co-op. Cheese Co., Millerton, Pa.
Moserville Co-op. Cheese Factory, Wells, Pa.
Myersburg Co-op. Butter & Cheese Factory, R. F. D. 10, Towanda, Pa.
North Rome Co-op. Creamery, R. F. D., Towanda, Pa.
Osceola Cheese Factory, Osceola, Pa.

Oswayo Co-op. Cheese Factory, Oswayo, Pa.
Trinket Co-op. Cheese Factory, Ulster, Pa.
Union Dairymen's Association, Wismer, Pa.

Individually Owned Cheese Factories—

Andrews Settlemen Cheese Factory, Andrews Settlement, Pa.
John Baumback Cheese Factory, R. F. D. 3, Union City, Pa.
B. Beach Cheese Factory, Sunderlandville, Pa.
E. A. Bean Cheese Factory, Knoxville, Pa.
Bean & Murdock Cheese Factory, Westfield, Pa.
E. S. Bell & Co., Cheese Factory, Austinburg, Pa.
Bertram Cheese Factory, R. F. D. 26, Cambridge Springs, Pa.
Bingham Center Cheese Factory, R. F. D., Ulysses, Pa.
Birchard Cheese Factory, R. F. D. 21, Cambridge Springs, Pa.
J. H. Bragdon Cheese Factory, Waterford, Pa.
T. J. Carmody & Co., Cheese Factory, Elkland, Pa.
John E. Case Cheese Factory, Turtlepoint, Pa.
Chatham Valley Cheese Factory, R. F. D. 2, Middlebury Center, Pa.
Cherry Flats Cheese Factory, Mansfield, Pa.
Chestnut Hill Cheese Factory, Bear Lake, Pa.
Chrystal Cheese Factory, Chrystal, Pa.
J. M. Clark Cheese Co., Mansfield, Pa.
Lawrence Clark & Co., Cheese Factory, Beaver Center, Pa.
A. C. Close Cheese Factory, Keeneyville, Pa.
Cloverdale Cheese Factory, R. F. D., Wellsboro, Pa.
Chas. J. Conable Cheese Factory, Gold, Pa.
Fred S. Coolidge Cheese Factory, R. F. D., Gillette, Pa.
Coryland Cheese Factory, R. F. D., Gillette, Pa.
Crossingville Cheese Factory, Crossingville, Pa.
Drakes Corner Creamery, Hatfield, Pa.
Drakes Mills Cheese Factory, Cambridge Springs, Pa.
East Greenville Cheese Factory, R. F. D. 3, North East, Pa.
East Greenville Cheese Factory, East Greenville, Pa.
Eleven Mile Cheese Factory, Eleven Mile, Pa.
Ellisburg Cheese Factory, Ellisburg, Pa.
Eldred Cheese Factory, Eldred, Pa.
Erie County Milk Association, Erie, Pa.
Espyville Cheese Factory, Espyville, Pa.
Excelsior Cheese Factory, Wattsburg, Pa.
Fairview Creamery, R. F. D. 1, Fairview, Pa.
Forest Home Cheese Factory, Waterford, Pa.
Frances Cheese Co., Girard, Pa.
Fraconia Creamery, Souderton, Pa.
Franklin Center Cheese Factory, Edinboro, Pa.
French Creek Cheese Factory, R. F. D. 1, Waterford, Pa.
Garland Cheese Factory, Garland, Pa.
Golden Rod Cheese Co., Cambridge, Pa.
Gravel Deerlick Cheese Factory, R. F. D., Knoxville, Pa.
Greeley & Obert Cheese Factory, Lincolnville, Pa.
Abraham F. Halterman Cheese Factory, Franconia, Pa.
Edward Hishman Cheese Factory, Venango, Pa.
Holly Bros. Cheese Factory, Souderton, Pa.
Honeoye Cheese Factory, Honeoye, Pa.
L. W. Howden Cheese Factory, Coryville, Pa.
Chas. Hunt Cheese Factory, Hickox, Pa.
Jewell Cheese Factory, Cambridge Springs, Pa.
A. B. Long Cheese Factory, Saegerstown, Pa.
Lottsville Cheese Factory, Lottsville, Pa.
McStay & Edwards Cheese Factory, Elmer, Pa.
Mainland Creamery, Mainland, Pa.
Matthews Run Cheese Factory, Youngsville, Pa.
Mende Bros. Cheese Factory, 1245 So. 11th Street, Philadelphia, Pa.

F. A. Millet Cheese Factory, Ulysses, Pa.
Millport Cheese Factory, Millport, Pa.
Moslertown Cheese Factory, Moslertown, Pa.
Mystic Cheese Factory, R. F. D. 4, Cambridge Springs, Pa.
Naseby Cheese Factory, R. F. D. 6, North East, Pa.
Newell Brook Cheese Factory, Eldred, Pa.
Nodine Cheese Factory, Cambridge Springs, Pa.
North Bingham Cheese Factory, North Bingham, Pa.
Northfork Cheese Factory, Northfork, Pa.
North Rome Creamery, R. F. D., Towanda, Pa.
Palmer Creamery & Cheese Factory, R. F. D. 2, Conneautville, Pa.
Rileyville Creamery Co., Rileyville, Pa.
Rockdale Center Cheese Factory, R. F. D. 27, Millers Station, Pa.
Salfordville Creamery, Salfordville, Pa.
Shinglehouse Cheese Factory, Shinglehouse, Pa.
Springboro Creamery, Springboro, Pa.
A. L. Squire Cheese Factory, Townville, Pa.
Daniel Strong Cheese Factory, Wells, Pa.
Summit Central Cheese Factory, R. F. D. 2, Erie, Pa.
Sylvester Cheese Factory, Westfield, Pa.
Tioga Cheese Factory, Tioga, Pa.
F. W. & Wm. Trowbridge Cheese Factory, Westfield, Pa.
Alex. Wass Cheese Factory, Little Marsh, Pa.
Waterford Cheese Factory, Waterford, Pa.
West End Creamery, Telford, Pa.
West Farmington Cheese Factory, Inc., Osceola, Pa.
Westford Cheese Factory, Westford, Pa.
West Union Cheese Factory, R. F. D. 2, Union City, Pa.
C. M. Wheeler Cheese Factory, Leboeuf, Pa.
White Corners Cheese Factory, Harrison Valley, Pa.
Woodcock Cheese Factory, Woodcock, Pa.
Woodcock Valley Cheese Factory, R. F. D. 12, Meadville, Pa.

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